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|  | SEAFARERS TRAINING CENTER  | M-CRW-1(I)-06 |
|   | <b>CROWD MANAGEMENT, PASSENGER SAFETY AND<br/>SAFETY TRAINING FOR PERSONNEL PROVIDING<br/>DIRECT SERVICES TO PASSENGERS IN PASSENGERS<br/>SPACES</b> | REV. 8 - 2018 |

## SEAFARERS TRAINING CENTER INC



***CROWD MANAGEMENT, PASSENGER  
SAFETY AND SAFETY TRAINING FOR  
PERSONNEL PROVIDING DIRECT  
SERVICES TO PASSENGERS IN  
PASSENGERS SPACES***

*In accordance with the STCW 78 Convention, as  
amended*

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## Scope

This course aims to meet the mandatory minimum requirements for training of master, officers, rating and other personnel on Ro-Ro passenger ships and on passenger ships other than Ro-Ro passenger ships in Regulation V/2, pa.4, 5 and 6 and Regulation V/3, pa.4,5 and 6 and specified in the STCW Code 1978 as amended Sections A-V/2 and A-V/3, pa. 1, 2, and 3.

## OBJECTIVE

A trainee successfully completing this training will be able to:

1. Control a crowd in an emergency situation on board
2. Locate essential safety and emergency equipment on board
3. Communicate effectively with passengers during an emergency
4. Demonstrate the use of personal life-saving appliances
5. Comply with the ship's safety and emergency procedures

## ENTRY STANDARDS

There are no specific entry standards. However, all personnel having responsibilities on board must undertake training dependant on those duties and responsibilities as detailed in 1, 2 and 3 below


1. Crowd management training is required for masters, officers, ratings and other personnel on Ro-Ro passenger ships and on passenger ships (STCW Code 1978 as amended Section A- V/2 Pa. 1, and Section A-V/3 pa. 1).
2. Familiarization training is required for masters, officers and other personnel assigned specific duties and responsibilities on ro-ro passenger vessels and on passenger vessels (STCW Code 1978 as amended Section A-V/2 pa. 3, and Section A-V/3 pa. 3).
3. Safety training is required for personnel providing direct service to passengers in passenger spaces (STCW Code 1978 as amended Section A-V/2 pa.3, and Section A-V/3 pa.3).

## COURSE CERTIFICATE

STC ensure that documentary evidence of training which has been completed is issued to every person found qualified under the provisions of Regulation V/2 for Ro-Ro passenger ships, or Regulation V/3 for passenger ships other than Ro-Ro passenger ships.

## COURSE INTAKE LIMITATIONS

The maximum number of trainees attending each session will be 25 persons.

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### **STAFF REQUIREMENT**

All training and instructors should be given, and assessment carried out, by qualified personnel who understand the specific objectives of the training, and have experience of the procedures established for the ships for embarking and disembarking passengers, for loading and discharging cargo, and for closing hull openings.

Instructors shall be qualified in this task for which the training is being conducted and have appropriate training in instructional techniques and training methods (STCW Code 1978 as amended Section A-I/6).

### **TRAINING FACILITIES AND EQUIPMENT**

For tutorial sections an ordinary classroom or lounge, messroom or cinema aboard should be provide for instruction. An overhead projector and audio visual equipment for videos may be required.

The practical training will be done on board a passenger ship.


### **TEACHING AIDS**

Instructor Manual

Overhead transparencies


Videos:

- V1 Basic Instinct (Passenger Mustering and crow control) (Code No. 603)
- V2 Shipboard familiarization (Code No.593)
- V3 Crowd Management

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**COURSE OUTLINE**  
**COURSE FOR RO-RO PASSENGER SHIPS**

| KNOWLEDGE, UNDERSTANDING AND PROFICIENCY  | LECTURE HOURS | SHIPBOARD PRACTICAL EXERCISE HOURS |
|---|---------------|------------------------------------|
| 1. Introduction to STCW 95  |               |                                    |
| 2. CROWD MANAGEMENT TRAINING<br>2.1 Lifesaving appliances and control plans<br>2.2 Assist passengers route to assembly and embarkation stations<br>2.3 Mustering procedures   | 1.00          | 1.50                               |
| 3. FAMILIARIZATION TRAINING<br>3.1 Design and operational limitations<br>3.2 Procedures for opening, closing and securing hull openings<br>3.3 legislation, codes and agreements affecting RO-RO passenger ships<br>3.4 Stability and stress requirements and limitation<br>3.5 Procedures for the maintenance of special equipment on RO-RO passenger ships<br>3.6 Loading and cargo securing manuals and calculators<br>3.7 Dangerous cargo areas<br>3.8 Emergency procedures | 2.50          | 1.50                               |
| 4 SAFETY TRAINING FOR PERSONNEL PROVIDING DIRECT SERVICE TO PASSENGERS IN PASSENGER SPACES<br>4.1 Communication<br>4.2 Lifesaving appliances  | 0.50          | 0.75                               |
| 5 REVIEW AND ASSESSMENT   |               |                                    |
| Subtotals   | 4.00          | 3.75                               |
| TOTAL   | 7.75          |                                    |

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### COURSE TIMETABLE FOR RO-RO PASSENGER SHIPS

| TOPIC   | PERIOD                                |
|---|---------------------------------------|
| <b>1. Introduction</b><br><b>2. Crowd management training –Module 2</b>                                     | 1 <sup>st</sup> Period<br>(1.5 hours) |
| <b>2. Crowd Management training- Module 2 (continued)</b><br><b>3. Familiarization training- Module 3</b>   | 2 <sup>nd</sup> Period<br>(2.0 hours) |
| <b>3. Familiarization training-Module 3 (continued)</b>   | 3 <sup>rd</sup> Period<br>(3.0 hours) |
| <b>4. Safety Training For personnel providing Direct Service to passengers in passenger spaces-Module 4</b> | 5 <sup>th</sup> Period<br>(1.25hours) |
| <b>5. Review and assessment</b>   |                                       |
| <b>Total</b>  | (7.75 hours)                          |

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## 1. Introduction to STCW 95

The cruise ship industry is growing; more and large vessels are carrying more and more passenger industry trend is the rapid and continuing growth in the size and capacity of passenger vessels; new larger ships can accommodate more than 2,500 passengers and carry crew of over 800.

### General


The industry is considered safe, yet during the period 1984-1994, 55 passenger vessels embarking passengers in U.S. port were involved in 92 reportable casualties. Risks inherent with travel at sea can be mitigated through enhanced safety awareness and training.

Personal injuries and fatalities associated with passenger ship accidents are low, relative to other modes of mass transportation. Ships are compartmentalized and zoned, facilitating safe evacuation in the event of a significant incident. Additionally, passengers participate in drills introducing them to safety procedures and equipment and are therefore aware of their responsibilities as well as of the crew in case of an emergency.

### STCW Code Requirements

The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (or STCW) of 1995 was recently amended to include specialized training for crew members of passenger ships, other than ro-ro passenger ships, engaged on international voyages. Seafarer's serving on board such ships must complete required training, laid out in section A-V/3 of the Code; in accordance with their capacity, duties and responsibilities, prior to being assigned shipboard duties. The new requirements become effective on January 1999. Follow-up currency training is required at intervals not to exceed five years.

Included in the new training requirements enumerated in the STCW Code of 1995, is Crow Management training for, personnel designated on Muster Lists to assist passengers in emergency situations on board passenger ships. There are three basic competency areas included in the Crowd Management Training requirements:

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## 2. Crowd Management Training

To ensure that seafarers are trained or qualified to carry out their duties on board ship

1. Seafarers shall not work on a ship unless they are trained or certified as competent or otherwise qualified to perform their duties.
2. Seafarers shall not be permitted to work on a ship unless they have successfully completed training for personal safety on board ship.
3. Training and certification in accordance with the mandatory instruments adopted by the International Maritime Organization shall be considered as meeting the requirements of paragraphs 1 and 2 of this Regulation.
4. Any Member which, at the time of its ratification of this Convention, was bound by the Certification of Able Seamen Convention, 1946 (No. 74), shall continue to carry out the obligations under that Convention unless and until mandatory provisions covering its subject matter have been adopted by the International Maritime Organization and entered into force, or until five years have elapsed since the entry into force of this Convention in accordance with paragraph 3 of Article VIII, whichever date is earlier.

### 2.1 Life-saving appliances and control plans

#### Muster List


A ship's Muster List will enumerate the duties assigned to all crewmembers; substitutes for key persons should also be specified. The Muster List will designate assigned positions and specify duties of each crewmember for response to emergency conditions.

#### Definition

Duties assigned in relation to passenger assistance shall include:

- |  |  |
|--|--|
| <p>Crowd<br/>Management<br/>Duties</p> | <ul style="list-style-type: none"> <li>• Warning passengers</li> <li>• Controlling passenger movements in passageways and stairwells</li> <li>• Assembling passengers at Muster Stations</li> <li>• Ensuring passengers are suitably clad and have properly donned life-jackets</li> </ul> |
|--|--|

The Muster List must be prepared and approved prior to the ship proceeding to sea and posted conspicuously throughout the ship including the bridge, engine-room and crew quarters. Should changes be required after initial approval, the Master shall revise the list or prepare an amended list.

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### Exits

Doors leading from passenger spaces to open decks or to alleyways used as escape routes are EXITS and must be marked with an "Exit" sign and symbol. "Exit" signs should be located over the door; if the door is not visible from within the space it serves an "Exit" sign with a direction arrow indicating the direction to the door should be provided.



Openings from interior spaces to open decks e.g. doors, windows, side scuttles, not normally used as thoroughfares, but could be used for emergency escape, are EMERGENCY EXITS should be marked with an "Emergency Exit" sign including the relevant symbol.




Routes and exits providing access to muster and Embarkation Stations must be lighted. In case normal lighting systems fail, or should smoke inhibit escape, low location lighting systems are installed to guide passengers to exits. These systems will be recognized by most passengers due to similarity to emergency lighting systems installed in commercial airplanes.

## 2.2 Assist passengers en route to assembly and embarkation stations

### Establishing Presence

Confusion: In such circumstances it be essential or establish authority prior to initiating assistance activities.



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A distinctive physical presence can be established by:

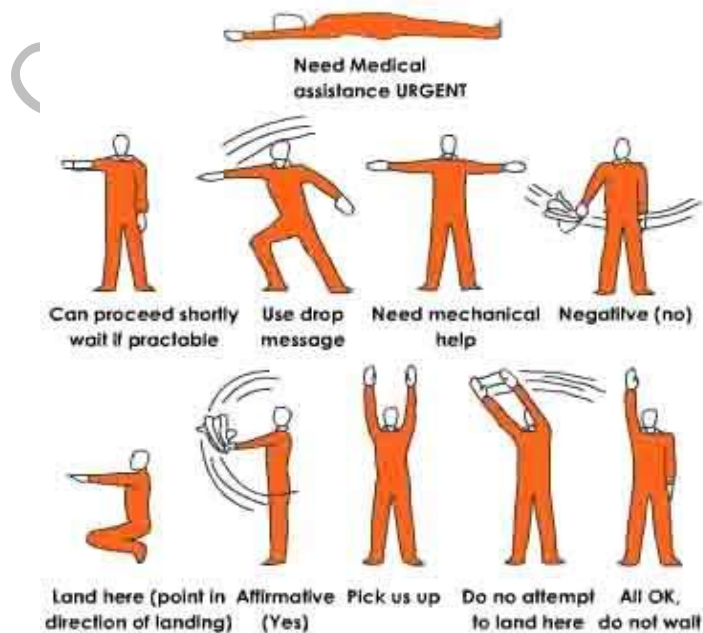
- Locating in a highly visible position; stand on a step or nearby platform
- Wearing a uniform or other "official" attire; passengers will tend to recognize superficial signs of authority
- Showing confidence; stand tall, establish eye contact with those addressed and accent verbal messages with body language


### Supplement Verbal directions

Should be supplemented with body language and hand signals. Some example hand signals are:

Suggested Command for passenger assistances in emergency situation:

- For safety reason we request all passengers go to their Muster Stations.
- Dress warmly; bring your life jacket and a blanket.
- Families stay together.
- Do not use elevators.
- Assist those who need help.
- Do not forget personal documents, your glasses and medicine.
- Do not return to your cabin to collect your property.
- Please follow instructions given by officers and crewmembers.
- Follow escape routes shown.
- Route to Muster Station 'A' is obstructed.
- Exit to user Station will be via the Promenade Deck exits.



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## **Control of Passengers in corridors, staircases and passageway**



**Controlling Passenger Traffic Special equipment or extra personnel might be needed to assist disabled passengers to safety. Crew members need to know location(s) of wheelchairs**

Each crew member designated to assist passengers in emergency scenarios must be thoroughly familiar with assigned responsibilities and procedures associated with facilitating passenger evacuation. Special attention should be paid to alternative routes; some routes might be blocked by fire, flooding or collision damage.

Assistance might be needed in situations such as:

- Exceptionally large groups
- Panicked passengers
- Handicapped or injured persons

Crew members should know procedures for requesting help from the ship's company.

Passengers can be used to help too. Good helpers may be people that are:

- Composed/calm
- Physically fit
- Knowledgeable of emergency situations e.g. military, firefighters, emergency health providers
- Exceptionally active persons

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## 2.3 Mustering Procedures

### Maintaining escape routes clear of obstruction

The principle on which means of escape provisions are based is that the time available for escape (an assessment of the length of time between the fire starting and it making the means of escape from the workplace unsafe) is greater than the time needed for escape (the length of time it will take everyone to evacuate once a fire has been discovered and warning given).

Regardless of the location of a fire, once people are aware of it, they should be able to proceed safely along a recognizable escape route, to a place of safety.




In order to achieve this, it may be necessary to protect the route, i.e. by providing fire-resisting construction. A protected route will also be necessary in workplaces providing sleeping accommodation or care facilities. It might also be necessary to apply positive air pressure to an escape route to discourage smoke from entering in the event of a fire.

### Method for evacuation of disabled persons



People with mobility impairments should be provided with some form of written directions, a brochure, or a map showing all directional signs to all usable circulation paths. For new employees and other regular users of the facility it may be practical to physically show them the usable circulation paths as well as provide them with written information. In addition, simple floor plans of the building that show the locations of and routes to usable circulation paths should be available and given to visitors with mobility impairments when they enter the building. A large sign could be posted at each building entrance stating the availability of written directions or other materials and where to pick them up. Building security personnel, including those staffing entrance locations, should be trained in all the building evacuation systems for people with disabilities and be able to direct anyone to the nearest usable circulation path.



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### **Preparation and Approval**

It is vital to shipboard and passenger safety that all crewmembers know their assigned stations and are able to perform respective duties in case of emergency. Upon hearing an alarm signal, each crewmember must proceed to their station and perform their functions as trained.

### **3. Familiarization Training**

New crew members joining a ship must be familiarized with their duties and important information about the ship. This is to ensure that the new people onboard ship understand their responsibilities thoroughly before commencing their duties.



It is the duty of the master of the ship to ensure that each new crew member is given proper familiarization training to ensure personal safety and well-being of the ship.


The master would designate a qualified person in charge of training the new crew members of the ship.

Though all crew personnel joining the ship have to do STCW training, there are several specific instructions, which are important for safe operations on ships.

#### **3.1 Design and operational limitations** **Maintaining Clear Escape Routes**

Some escape routes may tend to be more congested at certain times than at others. For example, dining areas will be crowded during serving hours, entertainment facilities will likely be more crowded at night, swimming pool areas will normally be at maximum capacity during mid- day. Crewmembers assigned to assist passengers during emergencies should be aware of times of the day or specific conditions that might be expected to pose particular concerns during evacuation activities.

In case of emergency; fire, fallen debris, etc. might block escape routes. Such circumstances might necessitate rerouting of passengers; crew members must be aware of alternated routes in-their area of responsibility.

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### **Alternate Routes**

Most passengers will be able to follow directions and proceed to Muster Stations on their own. However, some might be unable to do so and will require special assistance.

**Evacuation of Disabled Persons** Escape routes must be kept unobstructed at all times. Typical (obstructions might include luggage, cleaning carts, toolboxes, locked doors or laundry. Constant vigilance is necessary to ensure clear

Many impairments can render passengers "disabled", such as:

- Physically handicapped
- Mentally handicapped
- Injured
- Intoxicated

Different considerations will be prompted depending upon the particular disability. Special assistance may take the form of physical aid, adjusting speech (e.g. louder or slower) or showing special affection such as in the case of a child.

Most ships have special sections designated for disabled passengers. Crewmembers should be aware of any such areas as well as escape routes there from.


### **Aid Available**

Stretchers and medical equipment. Crew members or passengers can be enlisted as helpers if needed.

### **Searching Evacuated Spaces**

Some passengers might not adhere to evacuation orders and remain in their cabins. Some might initially evacuate and then return to retrieve personal belongings. In any case, passengers could become incapacitated and unable to evacuate.

Evacuated spaces should be thoroughly searched to confirm all passengers have vacated. Crew members with responsibility for particular passenger spaces should search their area and report status as per ship's policy.

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### **3.2 Procedures for opening, closing and securing hull openings**

#### **Annex IACS Unified Requirements S15**

S15 Side Shell Doors and Stern Doors (1996)

Retrospective application of UR-S9, as amended 1996, to existing ro-ro passenger ships

1. The structural condition of side shell doors and stern doors, especially the primary structure, the securing and supporting arrangements and the hull structure alongside and above the doors, are to be specially examined and any defects rectified.
2. The following measures are to be complied with by all existing Ro-Ro passenger ships no later than completion of the first annual survey commenced after 1 July 1997:
  - a. The structural arrangement of securing devices and supporting devices of inwards opening doors in way of these securing devices and, where applicable, of the surrounding hull structure is to be reassessed in accordance with the applicable requirements of S9.5 and modified accordingly.
  - b. The securing and locking arrangements for side shell doors and stern doors which may lead to the flooding of a special category space or ro-ro cargo space as defined in the SOLAS Convention, are to comply with the following requirements:
    - Separate indicator lights and audible alarms are to be provided on the navigation bridge and on each operating panel to indicate that the doors are closed and that their securing and locking devices are properly positioned. The indication panel is to be provided with a lamp test function. It shall not be possible to turn off the indicator light.
    - The indication panel on the navigation bridge is to be equipped with a mode selection function "harbour/sea voyage", so arranged that audible alarm is given if the vessel leaves harbour with side shell or stern doors not closed or with any of the securing devices not in the correct position.
    - A water leakage detection system with audible alarm and television surveillance is to be arranged to provide an indication to the navigation bridge and to the engine control room of any leakage through the doors.
3. Documented operating procedures for closing and securing side shell and stern doors are to be kept on board and posted at the appropriate places.

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### 3.3 Legislation, codes and agreements affecting ro-ro passenger ships

The roll-on/roll-off ship<sup>1</sup> is one of the most successful types operating today. Its flexibility, ability to integrate with other transport systems and speed of operation have made it extremely popular on many shipping routes. The roll-on/roll-off ship is defined in the November 1995 amendments to Chapter II-1 of the International Convention for the Safety of Life at Sea (SOLAS), 1974 as being "a passenger ship with ro-ro cargo spaces or special category spaces..."

One of the ro-ro ship's most important roles is as a passenger/car ferry, particularly on shortsea routes. But despite its commercial success, the ro-ro concept has always had its critics. There have been disturbing accidents involving different types of ro-ro ship, the worst being the sudden and catastrophic capsizing of the passenger/car ferry Herald of Free Enterprise in March 1987 and the even more tragic loss of the Estonia in September 1994.


This paper looks at the background of ro-ros, the problems involved and the way in which IMO has endeavored to tackle them.

Although ro-ros have proved commercially very successful, some concern has been expressed about ro-ro ships from the safety point of view virtually ever since the first ro-ro ships were introduced. The whole design concept is different from that of traditional ships because of the introduction of a number of elements which make ro-ro ships unique.

**1. The lack of internal bulkheads** On conventional ships, the hull is divided into a number of separate holds by means of transverse bulkheads, many of which may be watertight. In the event of the hull being holed, the bulkheads will limit or delay the inrush of water, resulting in the ship sinking slowly enough for the evacuation of those on board or even preventing the ship from sinking at all. With ro-ro ships the installation of unpierced transverse bulkheads is a major obstacle, at least on the upper "through" decks: the whole idea of the ro-ro ship depends upon being able to drive cargo on to the ship at one end and off again at the other. The installation of fixed transverse bulkheads would prevent this. Although ro-ros are all fitted with the watertight collision subdivision, and engine-room bulkheads below the freeboard deck prescribed by SOLAS, the huge vehicle decks make it possible for water to enter very rapidly and fire can also spread very quickly for the same reason.

**2. Cargo access doors** The cargo access doors at the stern and bow of the ship represent a potential weak spot, as do the side doors with which some ro-



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ro ships are equipped. Over the years such doors can become damaged or twisted, especially when the door also serves as a ramp.

**3. Stability** The movement of cargo on the vehicle deck can affect the intact stability of the ship, causing it to list. The sudden inrush of water following damage to the hull or failure of watertight doors can be 3 even more serious (and rapid). The fact that ro-ro ships generally have a very large superstructure compared with other types means that they can be more affected by wind and bad weather.

**4. Low freeboards** Cargo access doors fitted on cargo-only ro-ros are often very close to the waterline. This means that a defective trim or a sudden list, caused, for example, by the movement of cargo, can bring the access threshold below the waterline, resulting in a sudden inrush of water (if the door is open) which will in turn result in the list increasing and a possible capsizing of the ship.

**5. Cargo stowage and securing** A list can cause cargo to break loose if it is not correctly stowed and secured. The problem is made worse because the crew of the ship cannot normally see how the cargo is stowed inside or on the trailer in which it is transported. A heavy load which breaks loose can cause other units to follow suit. The result can be an increased list, the spillage of dangerous substances and, in extreme cases, damage to the hull and ship's structure.

**6. Life-saving appliances** The high sides of many modern ro-ros, including passenger ships, pose problems regarding lifesaving appliances: the higher a lifeboat, for example, is stowed the more difficult it can be to launch, especially if the ship is listing badly.

**7. The crew** The factors referred to above indicate that ro-ros are highly sophisticated ships which require very careful handling. This makes them exceptionally vulnerable to human error.

### **3.4 Stability and stress requirements and limitations**

There is something about Ro-Ro ships that make them completely different from other types of ships. But we will come to it a bit later, after knowing the broad categorization of ship types by IMO according to freeboard and subdivision.

IMO has classified ships into Class A and Class B.

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The Class A ships are those which have lesser sea openings and better protected from the sea, also because of stringent subdivision restrictions. But Class B ships are those which have higher freeboard and are directed by less stringent subdivision rules.

Now, RORO ships are of Class B, but what yet sets them different is that they have a completely open vehicle deck extending right from the fore to aft, without any transverse subdivision bulkheads in between.

The reason behind this is very simple, yet unavoidable- to make access of cars (and other vehicles) possible from the forward to aft ends of the ship.

Let's take a look at some of the main concerns regarding Ro-Ro ships:


#### **No Subdivision Bulkheads**

The problem with not having transverse subdivision bulkheads is actually an adverse one, given the circumstances. Transverse bulkheads are basically incorporated to maintain the damaged stability or water-tight integrity of the ship, in case of flooding of any of the compartments. Simple, that two consequent bulkheads shall limit the water flooding within themselves, and thus help the ship being stable even in case of some damage.

But here's what happens if water enters a RoRo ship- The flooding starts progressing. How? Consider that there has been a damage in any part of the ship, due to which, water starts flooding in it. Since the only restrictions are the aft and bow doors, the water actually starts progressing along the entire length of the ship. Sounds bad, but is actually worse. Why? Read on.

#### **Risk of Progressive Flooding**

Due to absence of subdivisional bulkheads, the water progresses along the length of the ship. This not only causes the ship to lose its inherent buoyancy, but adversely affects its stability because of increasing free surface effect. In case of a single compartment damage, as in case of any other ships, the free surface created by one or two compartments is lower than what is created in an entire Ro-Ro ship, as the free surface area in this case is much more, due to the absence of transverse bulkheads. As a result, the ship loses its stability more rapidly that we generally expect it to do so. However, even in case the ship is not damaged, a Ro-Ro ships always stands at a higher risk of reduced stability.

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### **Problem of Maintaining Stability**

Every Ro-Ro ship, being a Class B type, has considerable freeboard, which means it operates at a low draft. These ships are also featured with multi-tier decks for accommodation of cars, trailers and trains, therefore requiring higher overhead clearance. Due to this, the depth of these ships is very high, owing to a high depth to draft ratio.

Cargo is stowed up to the top-most deck, resulting in the rise in the accommodation deck. As a result of the increased depth to draft ratio, such ships are very sensitive to heeling moments, and a heeling moment cannot only be created by wind gusts or waves, but also internal cargo shifting. Thus, cargo latching and locking systems must be regularly checked and ensured so as to prevent cargo shifts during voyages.

Also, heeling moments in lightship condition are prevented by incorporating heeling tanks at port and starboard sides. There have been many accidents of Ro-Ro ships which have caused due to rapid heeling moments, giving the crew very less time for proper evacuation.

The disasters of MV Sewol (Korea, 2014) and MS Express Samina (2000) were basically due to the above explained theory. These ships being Ro-PAX had cost lives more than that of just the crew.

### **Ro-Ro are Stiff Ships**

Though this is a lot related to stability, but it's interesting to discuss it separately. The steel structure of Ro-Ro ships is designed to have a very low centre of gravity, as cargo is loaded up to the top most deck, this would offset the rise in centre of gravity. But due to the risk of rapid heeling, the overall centre of gravity of Ro-Ro ships are kept considerably low. Though this is stable, it laces a problem with itself. A reduced Centre of Gravity (CG) will always tend to decrease the rolling period of the ship. So if you're sailing on the ship itself, you'll feel that the ship is rolling too fast. It is true, that once it rolls, it will come back to its upright position rapidly (which means it is quite stable), but the rapid motions will cause you motion sickness. We call such ships to be stiff. This may also cause high stresses on the cargo lashing systems.

### **Problem of Cargo Doors**

Other than doors on the port and starboard sides, Ro-Ro ships also have aft or bow doors with ramps, for heavier cargo to be loaded from the port. Both these door types have had their individual kind of problems as discussed further:

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### 1. Stern Cargo Door:

Stern cargo doors are generally very close to the waterline of the ship. There have been cases, when the stern door was not locked properly (which is basically a human error, since improper locks are notified by the ship's systems). Guess what could have happened next? As the ship moved into the sea, the improperly locked stern door served as the source of water ingress. Though, this is a human error, several efforts to alter the design of these doors have been made, but it is nearly impossible to place such doors high above the waterline, as that would not be feasible for easy cargo loading when the ship extends her ramps onto the port.


### 2. Bow Door:

Many Ro-Ro ships have bow doors, i.e. the bow of the ship is itself a hydraulically hinged structure which acts as a door, from which a ramp extends out for cargo flow in and out of the ship. One of the worst maritime accidents has occurred due to the failure of this very system- on board MV Estonia in 1994.

Let's look at it this way. The bow of the ship is vulnerable to the waves as the ship surges. Since this goes on continuously since the ship has set sail, the material on the bow of the ship experiences fatigue. In case of MV Estonia, the bow door mechanism had undergone fatigue (which should have been replaced during surveys) and ultimately, it gave away. The bow door separated from the ship's hull, ultimately leading in progressive downflooding, which resulted in sinking. But even then, the inherent problem of "rapid heeling" existed, and as a result the time available for evacuation was insufficient.

### Location of Lifeboats

This is a matter of concern, especially for Ro-Ro Passenger ships. As we've known that Ro-Ro ships inherently have a considerably high freeboard, it is important to note the risk attached to it. In case of rapid sinking, there have been cases when the lifeboats could not be successfully deployed from the embarkation deck due to its height from the waterline. It is due to this risk, recent Ro-PAX ships are also equipped with inflatable chutes, which help the passengers to slide down from the embarkation deck, in case the deployment of lifeboats are impossible.

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### **3.5 Procedures for the maintenance of special equipment on ro-ro passenger ships**

Appropriate maintenance of equipment and machinery used on passenger vessels, including safety equipment and services, is controlled through legislation. Maintenance issues are reviewed as part of the regular surveys UK-registered ships are subject to.

- All shell opening securely closed
- Monitor television system operable

### **3.6 Loading and securing manuals and calculations**

- Cargo securing manual kept on board
- Structure and heavy loads
- Adequate securing points
- Adequate securing devices
- Lashing secured to chassis
- Follow national and international regulations

### **3.7 Dangerous cargo areas**

- Adequate ventilation
- No possibility of gases drawn to accommodation
- Regular patrol
- Doors from car deck securely closed
- Correct stowage, segregated with adequate access
- Reject damage or leaking dangerous cargo
- Emergency response equipment maintained and ready for use

### **3.8 Emergency Procedures**

- Prevent or reduce ingress of water
  - All shell opening securely closed
  - Monitor television system operable
  - Monitor leak detecting system operable
- Early reduction of speed
- Remove water
  - All scuppers clear
  - All portable pumps ready

## **4. Safety Training for personnel providing direct service to passengers in passenger spaces**

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Important to maintain good order and control, the scenario may have evolved to a point such that danger seems unmaned to passengers. Tension may increase during waiting periods and crowds can become unruly.

#### **4.1 Communication**

##### **Establish Authority**

Crewmembers at Muster Stations must take charge, to do so; they must establish authority, using similar techniques to those applied to establish a distinguished presence in preparation for giving directions for evacuation; take a visible position, wear distinctive "uniform", establish eye contact with passengers and speak in a clear low tone.

##### **Queues**

Passengers must be organized into queues to facilitate orderly boarding of lifeboats/life-rafts. Some helpful techniques include:

- Keep family and friends together
- Have taller persons in rear of formation
- Have people place a hand on person in front

##### **Accounting**

Once passengers have been guided to Muster Stations, it is accurate accounting for passengers are extremely important. Searching for missing person may be initiated based on roll call at Muster Stations. Passenger lists should be used for taking attendance; there should be a list of passengers assigned to each Muster Station.


#### **4.2 Lifesaving appliances**

##### **Passenger Preparation to Abandon Ship**

**General** Should the situation deteriorate to a point where abandon ship is necessary, passengers must be properly prepared.

Prior to boarding lifeboats/life-rafts, some final preparations should be made, including:

- Retrieve prescription medications
- Drink water
- Take sea sickness medication
- Dress warmly; even in warm climates

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### **Lifejackets**

Additionally, and very importantly, all passengers must have properly donned lifejackets (in accordance with manufacturer's instructions) before disembarking the ship. Crewmembers should assist passengers to don lifejackets, check operation of lights and confirm each has a whistle attached.

### **Additional Stowage**

Passengers will normally bring lifejackets to Muster Stations, however, lockers containing extra lifejackets and children's lifejackets should be located in the vicinity of Muster Stations. These lockers will be marked with easily identified symbols.

### **Avoiding Panic**

Generally, people tend to react too late to emergencies; they fail to sense immediate danger. When initial word is passed that an emergency exists, people may await more information before reacting or, they might acknowledge that danger exists, but are optimistic that the problem will be cured.

#### **General**


When they do react, passengers can be expected to follow one of three basic patterns:

- **Activity:** Between 10% and 30% will want to take some action and do something. These are people that might be used as helpers.
- **Passivity:** 50% to 75% will await instructions as to where to go and what to do. They want crew members' help.
- **Panic:** On rare occasions, a very small faction, 1% to 3%, might enter into a state of violent panic; screaming, shouting and running about.

Panic is caused by intense fear. It is a behavior prompted by perceptions that danger is immediate and severe and opportunity for escape is limited.

In a situation where panic does occur, it will probably be individual in nature; a single person may flee from assigned station or become immobile or disorganized.

### **Cause**

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Collective (group) panic is extremely rare, but critical should it develop. Collective panic is shared behavior; several persons in social contact simultaneously experience intense fear and flee or become immobilized.

#### Individual Panic

In case of emergency, passengers will expect some direction; crewmembers must take charge. Absent crewmember intervention:

#### Collective Panic

- Active persons may start doing things beyond their abilities and possibly cause unsafe condition to become even worse.
- Some passive passengers might follow the lead of active person(s).

#### Need for direction

- Already scared people might plunge into a state of panic.

Actions In order to avoid, or at least minimize, incidents of panic in case of emergency, crewmembers must establish authority and build a perception of order and control. Suggested actions include:

- Supply gradual factual information on status of scenario; rumors must be negated.
- Avoid dramatization; be calm in outward appearance.
- "Employ" active passengers; do not allow them to act freely.
- Keep families/friends together.
- Mate unaccompanied children with adult "helper".