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SETRAC COLLEGE OF OFFSHORE TRAINING

TRAINEE HANDOUT

PASSENGER SHIP FAMILERISATION COURSE

DGS APROVED COURSE AT LOWEST FEES IN INDIA

PSF COURSE TIME TABLE

Knowledge, understanding and proficiency	Lecture Hours	Practical Exercise Hours*	Faculty
1 Introduction to STCW 95			
2 Crowd management training 2.1 Life-saving appliances and contrns 2.2 Assist passengers en route to assembly and embarkation stations 2.3 Mustering procedures	1.00	1.50	Master (FG)
3 Familiarization training 3.1 Design and operational limitations 3.2 Procedures for opening, closing and securing hull openings 3.3 Legislation, codes and agreements affecting ro-ro passenger ships 3.4 Stability and stress requirements and limitations 3.5 Procedures for the maintenance of special equipment on ro-ro passenger ships 3.6 Loading and cargo securing manuals and calculators 3.7 Dangerous cargo areas 3.8 Emergency procedures	2.50	1.50	Master (FG)
4 Safety training for personnel providing direct service to passengers in passenger spaces 4.1 Communication 4.2 Life-saving appliances	0.50	0.75	Instructor
5 Review and assessment			
Subtotals	4.00	3.75	
Total	7.75		

Course	Timetable for Ro-ro Passenger Ships		
Topic		Period	
1.	Introduction	1st Period	Master FG
2.	Crowd management training	(1.5 hours)	Master FG
2.	Crowd management training (continued)	2nd Period	Master FG
3.	Familiarization training	(1.5 hours)	Master FG
3.	Familiarization training (continued)	3rd Period	Instructor
		(1.5 hours)	
3.	Familiarization training (continued)	4th Period	Instructor
		(1.5 hours)	
3.	Familiarization training (continued)	5th Period	
4.	Safety training	(1.5 hours)	Instructor
		7.5 HRS	
5.	Review and assessment		

Total course duration is 15 hrs

INDEX

Chapter 1

INTRODUCTION TO PASSENGER SHIP

A **passenger ship** is a merchant ship whose primary function is to carry passengers. The category does not include cargo vessels which have accommodations for limited numbers of passengers, such as the ubiquitous twelve-passenger freighters once common on the seas in which the transport of passengers is secondary to the carriage of freight. The type does however include many classes of ships designed to transport substantial numbers of passengers as well as freight. Indeed, until recently virtually all ocean liners were able to transport mail, package freight and express, and other cargo in addition to passenger luggage, and were equipped with cargo holds and derricks, kingposts, or other cargo-handling gear for that purpose. Only in more recent ocean liners and in virtually all cruise ships has this cargo capacity been eliminated.

While typically passenger ships are part of the merchant marine, passenger ships have also been used as troopships and often are commissioned as naval ships when used as for that purpose.

Types of Passenger Ships

An ocean liner, *Normandie*

A cruise ship, *Freedom of the Seas*

A ferry, *Mega Smeralda*

Passenger ships include ferries, which are vessels for day or overnight short-sea trips moving passengers and vehicles (whether road or rail); ocean liners, which typically are passenger or passenger-cargo vessels transporting passengers and often cargo on longer line voyages; and cruise ships, which often transport passengers on round-trips, in which the trip itself and the attractions of the ship and ports visited are the principal draw.

An ocean liner is the traditional form of passenger ship. Once such liners operated on scheduled line voyages to all inhabited parts of the world. With the advent of airliners transporting passengers and specialized cargo vessels hauling freight, line voyages have almost died out. But with their decline came an increase in sea trips for pleasure, and in the latter part of the 20th century ocean liners gave way to cruise ships as the predominant form of large passenger ship, with the main area of activity changing from the North Atlantic Ocean to the Caribbean Sea.

Although some ships have characteristics of both types, the design priorities of the two forms are different: ocean liners value speed and traditional luxury while cruise ships value amenities (swimming pools, theaters, ball rooms, casinos, sports facilities, etc.) rather than speed. These priorities produce different designs. In addition, ocean liners typically were built to cross the Atlantic Ocean between Europe and the United States or travel even further to South America or Asia while cruise ships typically serve shorter routes with more stops along coastlines or among various islands.

For a long time, cruise ships were smaller than the old ocean liners had been, but in the 1980s, this changed when Knut Kloster, the director of Norwegian Caribbean Lines, bought one of the biggest surviving liners, the SS *France*, and transformed her into a huge cruise ship, which he renamed the SS *Norway*. Her success demonstrated that there was a market for large cruise ships. Successive classes of ever-larger ships were ordered, until the Cunard liner *Queen Elizabeth* was finally dethroned from her 56-year reign as the largest passenger ship ever built (a dethronement that led to numerous further dethronements from the same position).

Both the RMS *Queen Elizabeth 2* (*QE2*) (1969) and her successor as Cunard's flagship RMS *Queen Mary 2* (*QM2*), which entered service in 2004, are of hybrid construction. Like transatlantic ocean liners, they are fast ships and strongly built to withstand the rigors of the North Atlantic in line voyage service,[1] but both ships are also designed to operate as cruise ships, with the amenities expected in that trade. *QM2* was superseded by the *Freedom of the Seas* of the Royal Caribbean line as the largest passenger ship ever built; however, *QM2* still hold the record for the largest ocean liner. The *Freedom of the Seas* was superseded by the *Oasis of the Seas* in October 2009.[2]

By convention and long usage, the size of civilian passenger ships is measured by gross tonnage, which is a dimensionless figure calculated from the total enclosed volume of the vessel. Gross tonnage is not a measure of weight, although the two concepts are often confused. Weight is measured by displacement, which is the conventional means of measuring naval vessels. Often a passenger ship is stated to "weigh" or "displace" a certain "tonnage", but the figure given nearly always refers to gross tonnage, which in this context has nothing to do with weight.

While a high displacement can indicate better sea keeping abilities,[3] gross tonnage is promoted as the most important measure of size for passengers, as the ratio of gross tonnage per passenger – the Passenger/Space Ratio – gives a sense of the spaciousness of a ship, an important consideration in cruise liners where the onboard amenities are of high importance.[4][5]

Gross tonnage normally is a much higher value than displacement. This was not always the case; as the functions, engineering and architecture of ships have changed, the gross tonnage figures of the largest passenger ships have risen substantially, while the displacements of such ships have not. RMS *Titanic*, with a gross register tonnage of 46,329 GRT, but a displacement reported at over 52,000 tons,[6] was heavier than contemporary 100,000 – 110,000 GT cruise ships which displace only around 50,000 tons. Similarly, the Cunard Line's RMS *Queen Mary* and RMS *Queen Elizabeth*, of approximately 81,000 – 83,000 GT, but displacements of over 80,000 tons,[7] do not differ significantly in displacement from their new 148,528 GT successor, RMS *Queen Mary 2*,[8][9] which has been estimated to displace approximately 76,000 tons[10][11] With the completion in 2009 of Oasis of the Seas, the first of the Oasis Class ships, the Cunard *Queens* of the 1930s have clearly been passed in displacement, as the *Oasis* vessels were projected to displace about 100,000 tons.[12]

However, by the conventional and historical measure of gross tonnage, there has been a recent dramatic increase in the size of the largest new ships. The *Oasis of the Seas* measures over 225,000 GT, over twice as large as the largest cruise ships of the late 1990s.

Chapter 2

EMERGENCY PTROCEDURE

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LIFEBOAT EMBARKATION STATIONS ■

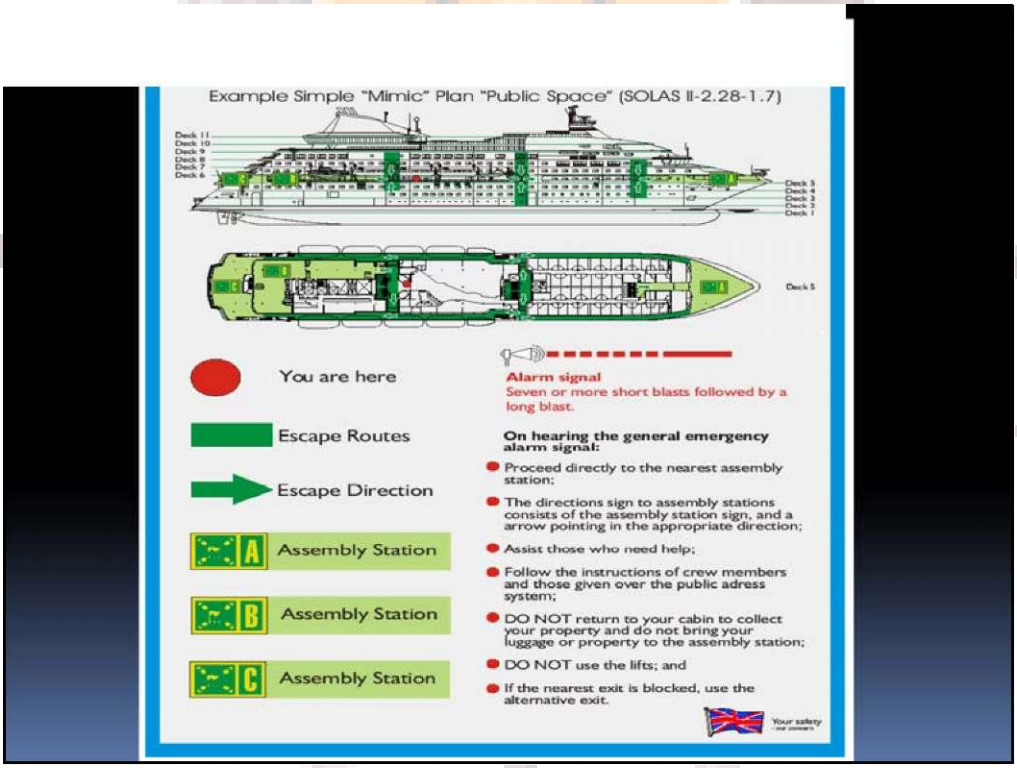
The human factors considerations of cruise ship safety are based on a simple philosophy - the ability to get thousands of passengers, wherever they may be on the ship, to an assembly point generally known as the muster station and from there to a lifeboat or a life raft in case the Captain issues the order to abandon ship.Every step is clearly thought out in the SOLAS and STCW regulations.

The escape routes are designed to accommodate a typical population of passengers (men, women, children, young, aged, mobility impaired) to pass through corridors and stairways on each deck to the main stairway and on to the muster or assembly station stations and finally the embarkation stations. This design takes into account the possibility that some portion of the escape routes, assembly stations, embarkation stations, or survival craft may be unavailable in case of an emergency. The analysis also takes into account human behavior that may cause congestion along the escape route and is modeled on well-documented data coming from civil building experience. These calculations are quite complex and are generally done by computer software that allows ship designs to be analyzed and firmed up using an iterative calculation technique

There are no dead-end corridors; there are two escape routes from every space, and at least one of those escape routes is required to provide continuous fire shelter to the lifeboat embarkation station. No door in the direction of escape can be locked.

Under these guidelines the total evacuation time for a passenger ship is 80 minutes which includes time taken for passengers to react to the announcement, travel to the assembly stations, board the survival craft and be lowered in the water. There is a 30 minute evacuation time requirement in SOLAS which is sometimes confusing , but this 30 minute criterion is the time required for all survival craft to be loaded and launched once passengers are all assembled with lifejackets donned.

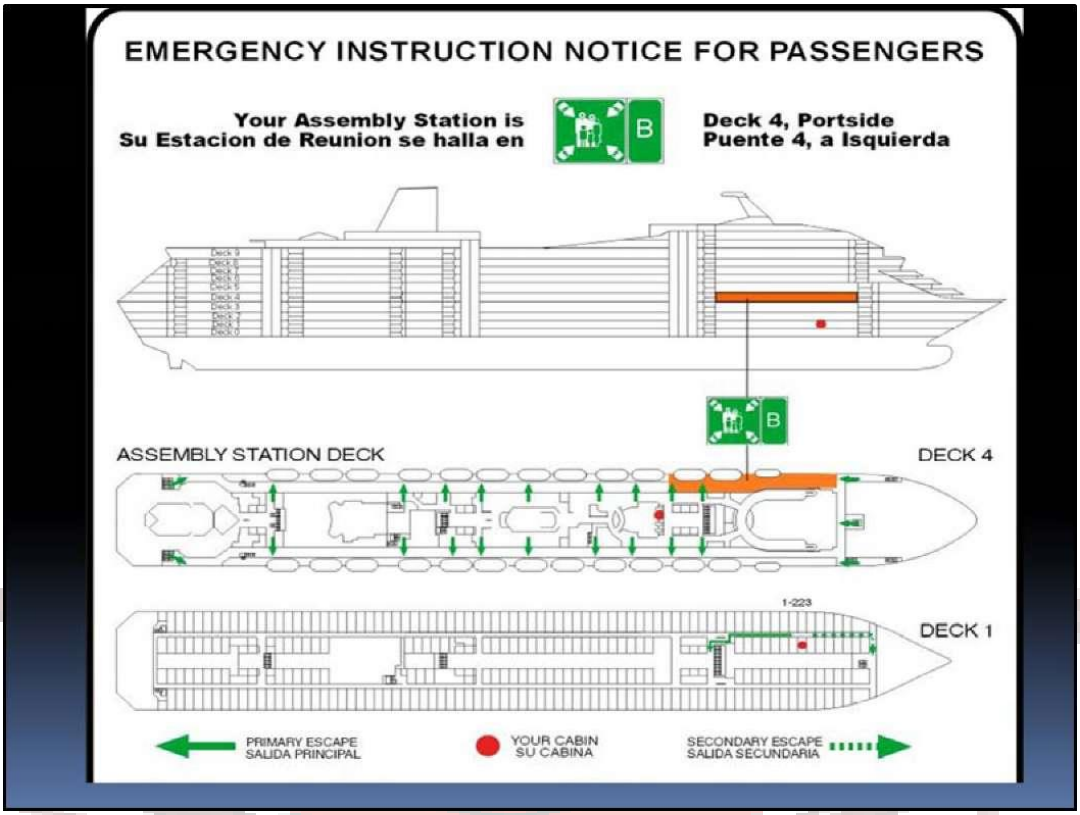
Safety Onboard



Next the marking:

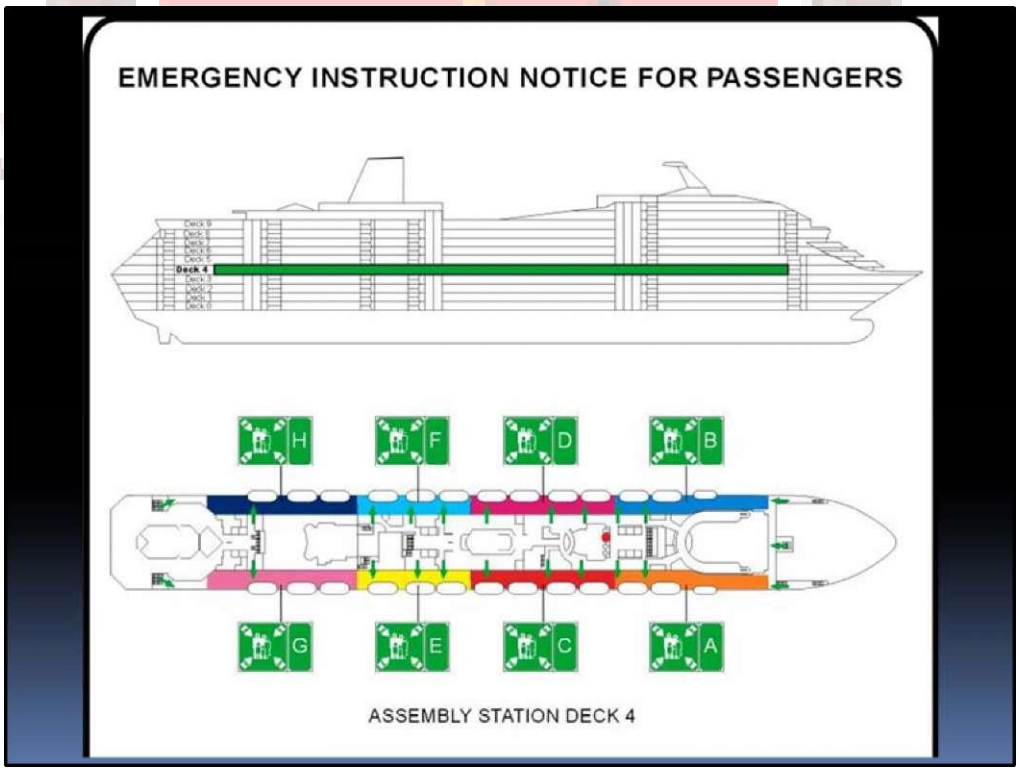
Escape routes including stairways and exits are marked with photo luminescent strip indicators or electric lighting supplied by emergency source of power (similar to the flooring lights that come on aircrafts). Decks are sequentially numbered starting with 1 from the lowest deck so that passenger may know intuitively where they are on a vertical plane. Similarly the cabin numbers increase from the aft to the forward end of the ship to provide a horizontal

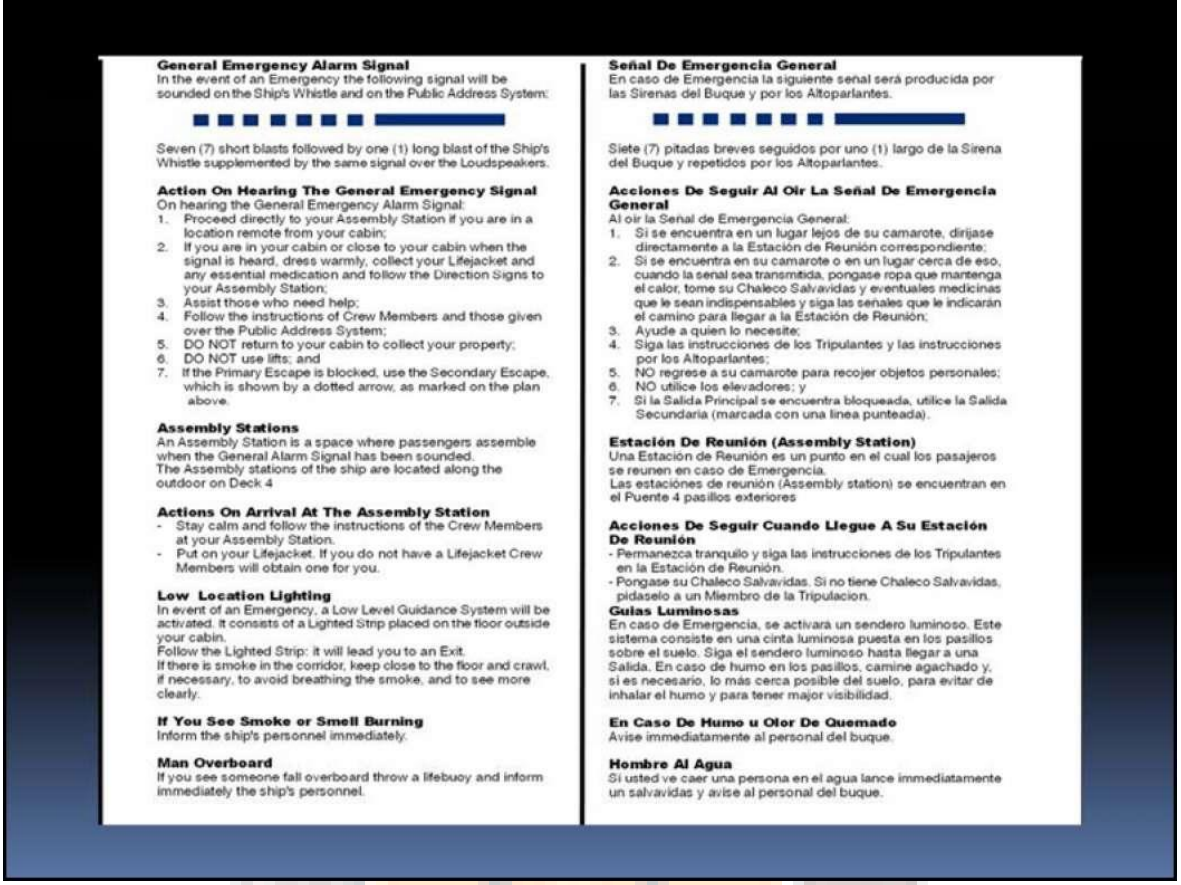
awareness. Simple mimic plans showing the "you are here" position and escape routes marked by arrows are prominently displayed on the inside of each cabin door and in public spaces. There are also written instructions informing passengers what to do in case of an emergency such as how to don a lifejacket, proceed directly to a muster station, etc.



Emergency and abandon ship drills

Whenever new passengers embark a passenger safety briefing is given immediately before or after sailing. Actual muster of passengers is required within 24 hours where they are instructed in use of lifejackets and the action to take in an emergency. Each passenger is assigned to a muster or an assembly station so that they know where they need to assemble should an emergency arise. The muster stations are generally large comfortable spaces such as a restaurant or a lounge located inside the ship where the passengers can gather and be sheltered from the weather. At the muster station, the crew give them regular and frequent updates on the situation and keep them thoroughly apprised of what is happening and what to expect. One of the fundamental tenants of Human Factors is that a person is far more apt to behave rationally and in a calm manner if they know what is happening rather than reaching conclusions based on conjecture. Another factor to maintain crowd control is that the passengers must know that somebody is in charge, both on the Bridge and locally. Clear, concise, announcements made in a calm manner over the public address system go a long way towards reassuring passengers and preventing panic and locally, at the muster station, the crew is trained to assume authority and provide amplifying directions.





General Emergency Alarm Signal
In the event of an Emergency the following signal will be sounded on the Ship's Whistle and on the Public Address System:

Seven (7) short blasts followed by one (1) long blast of the Ship's Whistle supplemented by the same signal over the Loudspeakers.

Action On Hearing The General Emergency Signal
On hearing the General Emergency Alarm Signal:
1. Proceed directly to your Assembly Station if you are in a location remote from your cabin;
2. If you are in your cabin or close to your cabin when the signal is heard, dress warmly, collect your Lifejacket and any essential medication and follow the Direction Signs to your Assembly Station;
3. Assist those who need help;
4. Follow the instructions of Crew Members and those given over the Public Address System;
5. DO NOT return to your cabin to collect your property;
6. DO NOT use lifts; and
7. If the Primary Escape is blocked, use the Secondary Escape, which is shown by a dotted arrow, as marked on the plan above.

Assembly Stations
An Assembly Station is a space where passengers assemble when the General Alarm Signal has been sounded.
The Assembly stations of the ship are located along the outdoor on Deck 4

Actions On Arrival At The Assembly Station
- Stay calm and follow the instructions of the Crew Members at your Assembly Station.
- Put on your Lifejacket. If you do not have a Lifejacket Crew Members will obtain one for you.

Low Location Lighting
In event of an Emergency, a Low Level Guidance System will be activated. It consists of a Lighted Strip placed on the floor outside your cabin.
Follow the Lighted Strip: it will lead you to an Exit.
If there is smoke in the corridor, keep close to the floor and crawl, if necessary, to avoid breathing the smoke, and to see more clearly.

If You See Smoke or Smell Burning
Inform the ship's personnel immediately.

Man Overboard
If you see someone fall overboard throw a lifebuoy and inform immediately the ship's personnel.

Señal De Emergencia General
En caso de Emergencia la siguiente señal será producida por las Sirenas del Buque y por los Altoparlantes.

Siete (7) pitadas breves seguidos por uno (1) largo de la Sirena del Buque y repetidos por los Altoparlantes.

Acciones De Seguir Al Oir La Señal De Emergencia General
Al oir la Señal de Emergencia General:
1. Si se encuentra en un lugar lejos de su camarote, diríjase directamente a la Estación de Reunión correspondiente;
2. Si se encuentra en su camarote o en un lugar cerca de eso, cuando la señal sea transmitida, pongase ropa que mantenga el calor, tome su Chaleco Salvavidas y eventuales medicinas que le sean indispensables y siga las señales que le indicarán el camino para llegar a la Estación de Reunión;
3. Ayude a quien lo necesite;
4. Siga las instrucciones de los Tripulantes y las instrucciones por los Altoparlantes;
5. NO regrese a su camarote para recojer objetos personales;
6. NO utilice los elevadores; y
7. Si la Salida Principal se encuentra bloqueada, utilice la Salida Secundaria (marcada con una linea punteada).

Estación De Reunión (Assembly Station)
Una Estación de Reunión es un punto en el cual los pasajeros se reunen en caso de Emergencia.
Las estaciónes de reunión (Assembly station) se encuentran en el Puente 4 pasillos exteriores

Acciones De Seguir Cuando Llegue A Su Estación De Reunión
- Permanezca tranquilo y siga las instrucciones de los Tripulantes en la Estación de Reunión.
- Pongase su Chaleco Salvavidas. Si no tiene Chaleco Salvavidas, pidaselo a un Miembro de la Tripulacion.

Guias Luminosas
En caso de Emergencia, se activará un sendero luminoso. Este sistema consiste en una cinta luminosa puesta en los pasillos sobre el suelo. Siga el sendero luminoso hasta llegar a una Salida. En caso de humo en los pasillos, camine agachado y, si es necesario, lo más cerca posible del suelo, para evitar de inhalar el humo y para tener major visibilidad.

En Caso De Humo u Olor De Quemado
Avise immediatamente al personal del buque.

Hombre Al Agua
Si usted ve caer una persona en el agua lance immediatamente un salvavidas y avise al personal del buque.

Emergency and abandon ship drills

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Survival Craft arid Lifejackets - SOLAS

■ Lifeboats (LB) and Life Rafts (LR)

50% LB on both sides

12.5% of LB can be substituted by LR or Marine Evacuation Systems (MES) on either side

25% additional LR capable of being launched from either side

• Life Jackets

- 105% +

Sufficient Life jackets for persons on watch +

- 10% Child life jackets
- Stowed so that readily accessible, plainly indicated, in cabins, muster stations, public spaces, or on direct routes between them
- To the satisfaction of the Administration

Survival craft and lifejacket requirements

Decision Support System for Masters of Passenger Ships - SOLAS Regs

Provided on the Bridge

Takes into account all foreseeable emergency situations

Damage to Ships

Fire

Pollution

Personnel accidents

Etc.

The regulations also require that a *Decision Support System for Masters of Passenger Ships* be provided on the navigation bridge that takes into account all foreseeable emergency situations such as fire, damage to ships, etc.

Chapter 3

CROWD MANAGEMENT

According to the STCW Convention and the HSC Code, all crew members onboard roro passenger ferries should be trained in Crowd Management, i.e. to control and effectively evacuate the passengers in case of an emergency.

Although the Convention, as it is written, applies to roro passenger ferries only, IMO has afterwards recommended that the same rules should cover other passenger-carrying vessels as well. Most National Administrations will consequently also require certificates of Crowd Management Training for crew members onboard cruising ships and other passenger ships.

In short, Crowd Management is the ability to assist passengers in an emergency situation; to control passengers in staircases, corridors and passages; to use procedures for preventing panic and other irrational behaviour; and to communicate with, instruct and inform passengers. Crew members shall furthermore be capable of mobilizing passengers to assist and also possess the capacity to convince and calm passengers when an emergency situation is over. To cope with this, the regulations call for knowledge in crisis management and human behaviour, with the training focused on applied psychology for competent assessment of both passenger and crew reactions .

According to STCW: The Crew Must Possess the Ability to Monitor and Manage a
Crowd During an Emergency Situation

- The crew must be able to provide passengers with relevant information during an emergency situation. (Once people know why they are required to take certain actions they are more willing to do so.)

- The crew must be able to take a leading role in an emergency situation. (Passengers must have faith in the personnel on the basis of their uniform and their verbal and nonverbal behaviour.)

- The crew must be able to react in a proper way after having assessed the reaction pattern of the passengers.
- The crew must be able to mobilize some of the passengers to assist.
- The crew must be able to convince passengers that an emergency situation is over if this really is the case.

Crew Training -STCW requirements

Crowd Management, Crisis Management, Human Behavior and Safety Training

Knowledge of general design and layout

Awareness of human behavior under stress

Ability to lead and direct others in emergency situations

Ability to establish and maintain effective communications

Competency demonstration via knowledge, understanding and proficiency

Crew Training -STCW requirements

Crew are assigned emergency duties to assist passengers. All masters, officers, ratings and other personnel must complete specialized training in accordance with their capacity, duties and responsibilities. These requirements include a multitude of topics within major areas of

Crowd Management Training

Crisis Management and Human Behavior Training; and Safety Training

In addition, every crew member that is assigned emergency duties is trained and required to be familiar with the duties assigned to them. These could include checking to see if the passengers are suitably dressed and that the lifejackets are correctly donned. They are also trained in conducting a search and rescue of any passengers that may be trapped in their staterooms and in the proper start-up and operation of emergency equipment such as survival craft and other life saving appliances.

Crowd and Crisis Management and Human Behavior training are designed to prepare crew to assist passengers in a stressful situation such as when they have become separated from their loved ones or worse, from their young children; to provide a figure of authority and calm; to be able to manage the crowd in confined spaces such as stairways and enclosures. But this is a tough task - people behave in very different ways:

some panic and have difficulty following instructions

Some will not accept that there is an emergency situation till much later

Others may panic and run back into danger searching for their loved ones

Some may try and run back into their cabins to get medications or other personal effects

Multiple languages

This is a particularly difficult task. Crews on cruise ship can be from many countries and it not unusual to have 50 different nationalities speaking as many different languages on board. STCW specifies the crew member will have knowledge and proficiency in establishing effective communications and these include at least the use of elementary English vocabulary and the possible need to communicate by demonstration or hand signals.

The Nucleus for Chaos Is Inherent in All Emergencies

The reasons for the IMO regulations are obviously past lessons but probably also that passengers often by far outnumber crew members. It is not unusual for vessels carrying three or four thousand passengers to only have a crew of between two and three hundred and for fast ferries carrying close to one thousand passengers to have less than fifty crew to handle an emergency and a possible evacuation. Coping with any emergency situation, with all its inherent possibilities for chaos, naturally calls for very intelligent, effective, knowledgeable and trained behaviour by the crew.

Normally, evacuation plans and drills are aimed to cover all concievable situations and to guide the crew in coping with ominous situations in an organized manner. Plans, while very important, do not as a rule take into consideration the tendency for real emergencies to develop beyond what was expected. Nor can we plan for what we are unable to imagine. Plans and drills have thus limitations.

The Crowd Management Training is Designed to Cope with The Unexpected

Regarding a crowd's reaction patterns in a crisis or in emotional turmoil, unpredictable behaviour must be regarded as regular. To also cover unexpected situations, the Crowd Management Training is designed to facilitate a flexible approach as well as intelligent and effective improvisations by the crew. To accomplish this, the training aims at understanding the basis for how people react. Such knowledge facilitates for all crew members to read, recognize and understand various types of behaviour and to address the underlying emotional origin, instead of only vainly fighting the behavioural consequences. To gain this deeper insight, the training is designed and supervized by experienced maritime psychologists.

Responsibility Increases the Coping Potential

The course also emphasizes the importance of the crew's behaviour. As stated in IMO documents derived from the STCW Convention and the HSC Code: "The passengers

must have faith in the personnel on the basis of their uniform and their verbal and non-verbal behaviour." The course therefore deals with both responsibility and authority as means for crowd management.

The sense of responsibility is important because it is an established psychological fact that responsibility increases a person's capacity to withstand stress. Crew members must therefore be constantly aware of their responsibilities towards the passengers in emergency situations. This awareness, in combination with their training, will help them to overcome their own emotional turmoil and stress and to react and act in a more rational way.

The same dynamics also lie behind some parents' extraordinary capacities when they are together with their children and also behind why some passengers voluntarily approach the crew and offer their assistance. They probably volunteer for two different reasons. Firstly because they feel that they can help, and secondly because having a role and a responsibility helps them to overcome their own stress. Doctors, nurses, policemen, seafarers and fire-fighters on leave together with other professionals are often especially prone to cope with their stress in this constructive manner, and they should also be welcomed by any small crew as a valuable reinforcement.

Authority Is a Prerequisite in Crowd Management

The course also deals with the problem of authority because the great majority of crew members are catering personnel. Many of them are employed because they possess other desirable characteristics than those which are useful in Crowd Management. Often they are employed because of their service-mindedness, their friendliness and because of their attractive personal appearance. Many catering crew are therefore quite young, usually good looking, often female, but without badges of rank and therefore lacking inherent authority. Furthermore they work in a position onboard which is not commonly regarded as superior and their uniforms may not be designed to suggest authority.

In an emergency situation, the catering personnel constitute the better part of the "troops" and are expected to be in charge of the passengers. Besides this, the passengers are expected to trust them, to follow their instructions and to lean on them for guidance and rescue. To be able to summon passengers, to handle the various difficult passenger categories mentioned earlier, to persuade someone to slide down a MES or to enter a lifeboat, everyone needs lots of authority. Therefore the course deals with various aids in achieving authority. Besides the authority of uniforms and other signs identifying them as crew members, one means of projecting authority is being able to make one's voice heard above others. Small megaphones are therefore important equipment. They need not be used constantly, however, because they will also function as symbols of authority.

Another important focus in the course is how to gain superiority of information for the crew. If passengers and crew members share the same information originating

from the public address system, difficulties can arise about who is the best to judge and interpret the information. Especially difficult situations can arise when the noise level in an open area is high, and a certain crew member is unable the hear loudspeaker messages while passengers can.

Crew members might be bewildered and rapidly lose their authority if they are late in understanding or hearing instructions and information from the bridge. They should therefore be equipped with portable radio telephones and an information channel of their own. The portable radio telephone need not be used at all times because it also functions as a symbol of authority, and using an earphone gives passengers the impression that the crew is better informed.

Experience from The Estonia Disaster

In the Crowd Management Course we utilize all available experiences from past emergencies and accidents in order to draw conclusions and to learn about the behaviour of passengers and crew members. The disaster with the *Estonia* bears in this sense all the distinctive features of an unthinkable situation and constitutes in every detail the worst possible scenario.

The Estonia accident happened in the middle of the night and in weather that was near storm and increasing. From the start of the accident, at about 0115hrs, until the ferry had disappeared from the water surface at about 0155hrs was only 40 minutes. Most passengers and crew members were asleep and was alarmed by metallic blows followed by a list of about 5 degrees. From the start of the accident until the list were too severe to allow people to get out any longer took only about 15 minutes.

Nevertheless, as many as about 300 people made it to the outside deck, of whom 137 survived. Most of them who made it were half naked or not properly dressed. Those who managed to get into liferafts were drifting in the storm until daybreak for between four and seven hours before being rescued. Many died during these hours from exhaustion and cold. The water temperature was 12 degrees Celsius and the air temperature only 9. As many as 852 people lost their lives.

From the survivors' statements we can learn about the activities of crew members and the reaction patterns of both crew and passengers. We have reports on panic, paralysis, shock, inability to understand, inability to find purposeful action, exhaustion, altruistic and heroic behaviour, just to mention some. This is thoroughly dealt with in the accident report, which will be published this summer, in order to gain all possible experience from this accident for use in Crowd Management Training programmes.

The participants in the Crowd Management Course are thus able to gain insight, from this worst of all scenarios, into what kinds of behaviour a crew must be able to manage, but also what happens if a Command Team is unable to lead the evacuation. We can learn about improvisations, the impact of alarm signals, spontaneous attempts to organize, collective and individual efforts, when and under what circumstances an organization may break down and also about the assistance by volunteer passengers.

The aim of the course in Crowd Management is not to prepare a crew for unmanageable scenarios but to mentally prepare every crew member so that they are able to manage the passengers in an organized and controlled way. They should be clear about what expectations society and passengers have upon them and deeply feel the responsibilities they have as crew members onboard a passenger ship.

In order to handle unexpected situations they must also gain insight into a variety of reactions and with the help of their own imagination be able to visualize and prepare themselves for what they might face, if and when an emergency situation should arise.

Chapter 4

COMMUNICATION

Issuing inaccurate information through the public address system, communication of insufficient information or informing in a faulty manner may create an unmanageable situation for the rest of the crew. Therefore the officers learn about various pitfalls and their expected consequences in passenger and crew reactions. Officers are even taught a good and structured way of giving information and they are supplied with a checklist which should be kept on the bridge for their guidance.

Informing Passengers in Case of Emergency

- Information to passengers must be given high priority
- Be prepared for stress reactions from passengers and crew members
- Control the information
  - The crew must be more well informed than the passengers.
- Never lose your credibility
  - Introduce yourself (title and name) and keep your voice under control.
  - Talk slowly and clearly. Inform without being talkative. Avoid technical language.
- The messages must agree with what the passengers themselves are experiencing
  - Report everything that the passengers can perceive or understand themselves.
- Do not make light of real risks
  - Passengers may expect that the truth is being kept from them.

1. Tell what has happened
2. Give your appraisal of the situation
3. Give details about what measures have been taken
4. State the expected outcome
5. State whether the situation has been reported ashore
6. Point out that the crew is trained for the task and that the passengers must follow their instructions
7. State the point in time for the next announcement

- Give information frequently
  - Every 10 to 15 minutes during an active phase. Every half hour or hour during a more stable phase. Restrict yourself to instructions and information only.
  - Specify the precise time for the next announcement and keep the time punctually.
  - Repeating previous information is also informative.
  - Uncertainty is the worst state.
- Help passengers find their relatives and travel companions.

Alarm Signals Are Not Sufficient

Most accidents have taught us that alarm signals, together with distress calls, often are transmitted too late. Hesitations in using alarm signals are understandable because of their consequences onboard, their impact on passengers, the stress they cause and the difficulties in reversing the arising situation. This discussion is aimed at understanding the psychological dynamics behind the reasons for delay in order to be able to cope with undue hesitations in a rational way.

Experience shows, for example, that alarm signals seldom cause panic among passengers. On the other hand, alarm signals are mostly not immediately understood. They give no guidance to the passengers and must therefore be followed by vocal instructions and information.

The normal reaction among passengers when an alarm signal sounds is a sudden interruption in whatever activities the they are involved in. Most people will turn their faces and start looking at the device which produces the alarm signal. After some moments of silence most of them will start discussing the signal and questioning each other in order to investigate possible interpretations, rule out misunderstandings and to reach a joint conclusion regarding its significance. This rather slow reaction pattern is formed by a mix of surprise and disbelief together with a reluctance to be intruded upon by something stressful and potentially dangerous in whatever pleasurable activities they are involved.

The alarm signal as such gives no guidance to the passengers about what they are supposed to do. Past experience shows that most passengers don't look at instruction posters and if they do, they are not able to remember what the posters said. Experience seems also to show that the International General Emergency Alarm signal is too complicated. Seven short (or more) and one long signal are not spontaneously regarded by most people as a distress alarm. Moreover, the signal is long and may be misinterpreted if someone only hears parts of it.

Passengers may believe that five or six short signals followed by a long signal denote something else than a General Emergency Alarm. Furthermore the signal does not form a rhythmical pattern or a melody like other familiar signals such as the fire-brigade's or the ambulance's. Furthermore it is not continuos as most other signals but instead repeated. Besides this, the General Emergency Alarm signal is not easy to distinguish for people who are unable to count, such as small children.

Using only alarm signals, leaves passengers alarmed and usually confused. They are left on their own to evaluate the situation and to find out what is expected of them. Therefore alarm signals by themselves may create a disorganized situation if people evaluate the situation differently and follow one another in a variety of actions. The officers are therefore informed that alarm signals immediately must be complemented by vocal messages giving instructions and more information.

A vocal message can give passengers directives and information and assure that all perception of the situation and options for actions are in line with the current situation

and what is wanted by the Command Team. The importance of directives, instructions and information through the public address system directed to the passengers is heavily stressed in the Crowd Management Course because this is the most effective means to handle masses of passengers.

Passengers must have instructions for rational action. Otherwise they are left to themselves to find out what to do in an unfamiliar environment and this may result in a variety of irrational behaviour. People also tend to forcefully react in line with their own perceptions of a distressful situation and therefore the crew must take charge of the passengers' understanding. The means for this is to give adequate information. Information alone is, however, seldom sufficient onboard vessels because merely understanding a situation will not always lead passengers to rational actions if they are unfamiliar with the onboard environment.

When sounding alarms, the best way is therefore to immediately use the public address system to complement the alarm signal. In this case the message should be reversed, with instructions first, followed by information, i.e. actions primary, understanding secondary.

Chapter 5

PASSENGER SHIP OPERATION

The passanger ship has to take appropriate clearance from the respective administration for the voyage. It should have appropriate provisions and supplies to and adequate life saving applicances in accordance with the voyage duration whether the voyage is short Voyage or an International voyage.

Expected Sea conditions

The applied sea conditions are to be taken Into account for stability consideration of vessel. The whether forecast has to be obtained at regular intervals. If required, ballast is to be taken into heavy wheather ballast tank for imroving the margin of stability to care for adverse sea conditions The passengers are to be warned about the prevailing sea condtions and rolling/pitching of ship. The securing of the goods and cargo has be done properly.

Ship Characteristics & Limitaion. The operating charasteristic of ship and limitations should be familier to the ship staff Type of Cargo

Certain passenger ships operated in dual mode in addition to carrying passengers and also cargo. The type of cargo carried in passenger ship should not be hazardous and leopard is the safett of passenger. Appropriate laod lines are marked when carrying passengers or cargo. It is to be ensured that same are not immersed. The cargo ship be appropriately secured. The passange should not be permitted to access to the cargo spaces and as there is a distinct possibility of tempering with the securing of the cargo lashing.

Icing

Vessels are classed for various types of operator in ice depending upon the depth / age of ice and warm clothing. The vessels are classed by the various society such as Liods register. The vessel should have appropriate class certificate prior to operating in the area. The precautions to be taken for vessek operatin in ice are as given below:

1. Warm clothing helmets, ice shoes etc.
2. Cover all machinery with canvas.
3. Check all heating systems of accommidation & machinery
4. Check all draining and drain cocks

5. De-icing compound to be ready.

6. Damage control gear ready

7. Drain all lines and water cooled system unless antifreeze is used.

8. Receive ice patrci builetin

Basic procedures for opening, closing securing hull openings.

The hull opening/closing should not be presumed that they are opened / closed. The operator should give a feedback as to the status of the opening. The ship staff under no circumstances should take the non reporting of a certain action as to every thing being right; The vital openings should be as far as possible be under TV surveillance. A patrol system should also be intituted to monitor the unmanned & spaces and check for any incidents. Indicator lights and closed circuit television checked doors and other closing appliances which, if left open or not properly secured could, in the opinion of the administration, lead to major flooding of a special category space on ro-ro cargo space. The indicator system shall be designed on the fail safe principle and shall show if the door is not fully closed or not secure. The power supply for the indicator system shall be independent of the power suppply for operating and securing the doors.

Indicators shall be provided on the navigating bridge for all shell doors loading

Means shall be arranged, such a television surveillance or water leakage detection system to provide an indication to the navigating bridge of any leakage through bow doors, stem doors or any other cargo or vehicle loading doors which could lead to majorflooding of special category spaces or ro-ro cargo spaces.

Entries In log book

The opening/closing of hull openings should be entered In ship log books The procedure is mandatory as the responsibility becomes very clear and the signatures leads to a better compliance of the regulation.

Basic stability and strs requirements and limitations

Every passenger ship regardless of size and every cargo ship having a length, as defined in the international Convention on load lines in force, of 24 m and upwards, shall be inclined upon Its completion and the elements of its stability determined. The master shall be supplied with such information satisfactory to the administration as is necessary to enable him by rapid and simple processes to obtain accurate guidance as to the stability of the ship under varying contitions of Service. A copy of the stability information shall be furnished to the Administration

Sufficient intact stability shall be provided in all service conditions so as to enable the ship to withstand the final stage of flooding of any one main compartment which is required, shall be determined as follows :-

The positive residual righting lever curve shall have a minimum range of 15 beyond the angle of equilibrium

The area under the righting lever curve shall be at least 0.015 m rad, measured from the angle of equilibrium to the lesser if:

The angle at which progressive flooding occurs.

22(measured from the upright) in the case of one - compartment flooding, or 27 (measured from the upright) in the case of the simultaneous flooding of two or More adjacent compartment

Procedures for the maintenance of special equipment on passengers ships

Planned maintenance programme

Every passenger ship should follow a applaned maintenance programme The advantage is that the equipment is regularly serviced at pre-defined intervals which are dependant upon a plan manner thus ensuring a long life and reliability of the equipment.

Constant visual Chcks

The door openings and other watertight integrity openins are crucial for the safety of the vessel. The procedure should be in place where in a visual check should also be carried out in addtion to other information seeking means such as indicators for door openinsg/closing provided on the bridge.

Scuppers Clear

The accumulation of water on the upper surface will effect the stability of the vessel. It is to be ensured that the scuppers are clear so they any accumulation of water which takes place on board the vessel is quickly cleared by having clear scuppers.

Loading and cargo securing

Ship's Cargo Securing manual

Every ship is required to have a cargo securing manual wherein the guidelines are laid on how to secure the cargo adequately and thereby preventing any movement of cargo during the voyage. The ship staff should consult on cargo securing manual prior to securing of cargo.

Adequate & Maintained Equipment

The equipment onboard should be adequate and it should take Into account any failures as well as redundancy into account. The equipment should be well maintained so that its always available and does not adversely affect the safety of the passenger

Adequate Securing Points

The ship should be provided with the adequate securing point for the cargo as well as the baggage.

Dangerous cargo areas

In cargo spaces whrever the dangerous cargo is kept there is likely hood accumulatin of vapour/dangerous gases taking place. Adequate means of ventilation need to be provided for removing the same. No part of the ships crew is to enter the area without proper ventilation in place.

Doors from Car Dock Securely closed

The car deck should securely closed and passengers are not to be given access to the car deck area Correct Stowage

A stowage plan should be prepared well in advance and cargo should be stered in accordance with the plan. The cargo should be stored properly and withh adequate securing

Chapter 6

PASSENGER SHIP LSA REQUIREMENTS

A) BASIC LSA REQUIREMENTS

see all the regulations as per SOLAS chapter III & IMO (1997) International Life-Saving Appliance Code (LSA code).

B) ADDITIONAL REQUIREMENTS - SECTION -1

Regulation-21:- survival craft & rescue boats - Passenger Ships on international voyages which are not short must carry partially or totally enclosed lifeboats on each side to accommodate not least 100%) Some lifeboats can be substituted by liferaft. In addition, inflatable or rigid lifecrafts

Regulation-21:- survival craft & rescue boats - Passenger Ships on international voyages which are not short must carry partially or totally enclosed lifeboats on each side to accommodate not least 100%) Some lifeboats can be substituted by lifecraft. In addition, inflatable or rigid lifecrafts to accommodate at least 25% of the total number of persons on board.Passenger ships on short international voyages must carry partially or totally enclosed lifeboats for at Ieast30% of persons on board, plus inflatable or rigid lifecrafts for 25% of total numbewr of person on board, All survival craft required providing for abandonment of person onboard must be capable of being launched with their full complement of persons & equipment within a period of 30 minutes from the time the abandonment signal is given.

Regulation- 22:- Personal life saving applicance - Given requirements for number of Lifeboats immersion & thermal suits & extra lifejacket that passenger must carry, each lifejacket must be fitted with a light.

Regulation 23:- Survival craft & resuce boat embarkation arrangements - Gives requirements for embarkation arrangements.

Regulation 24:- .Stowage of survivals craft - Gives stowage requirements.

Regulation- 25:- Muster stations - muster stations must be in the vicinity of & allow easy access to, embarkation stations & must have ample room, at least 0.35m2 per passenger.

Regulation 26:- additional requirements for ro-ro passenger ships- includes requirements for ro-ro passenger ship's lifecrafts to be served by either marine evacuation systems or launching appliances complaint with the LSA code. At least one of the resue boats must be a fast rescue boat Ro-Ro passenger ships must be equipped with efficient means for rapidly recovering survivors from the water & transferring them from resuce units or survivals craft to the ship. A sufficient number of lifejackets must be stored in the vicinity of muster stations so passengers do not have to return to their cabins for lifejackets. For existing ships, the life jackets

requirements must be complied with not later than the first periodical survey after 1st July 1999. All other requirements must be complied with the 1st periodical survey after 1st July 2000.

Regulations -27:- Information on passengers all persons on board passenger ship must be counted before departure with of persons needs for special care or assistance communicated to the master. Details must also be kept ashore. By 1.1.99, names & gender of all persons, distinguishing between for search & rescue purpose (Administrations may exempt passenger ships from this requirements of the scheduled voyages of the ship makes it impracticable to comply).

Regulations -28:- Helicopter landing & pickup areas - all ro-ro passenger ships must be fitted with a helicopter pick-up area. All passenger ships 130 m in lenght & over constructed after 1st July 1999 must be fitted with a helicopter landing area.

Regulations -29:- Decisioin support system for masters of passanger ships - in all passenger ships, a decision support for emergency management must be provided on the navigation bridge. Should consist of, as a minimum, printed emergency plan or plans covering all emergency situtaions, including fire, damage to ship, pollution, unlawful acts threatening the safety of the ship & passengers & crew personnel accidents, cargo-related accidents & emergency assistance to other ships constructed before 1st July 1997 must comply not later than the first periodical survey after 1st July 1999.

Regulations -30:- Drills - on all passenger ships, an abandon ship & fire drill must take place weekly.

Regulations -35:-Training manual & onboard training aids- on all ships, a training manual must be provided in each crew mess room & recreation room or in each crew cabin, The training manual must contain instructions & information in easily understood terms, illustrated where possible on LSA provided on the ship & best methods of survivals. The regulation lists the elements, which must be explained in detail.

Regulations -36:- Instructions for on-board maintenance - instructions for on-board maintenance of LSA should be easily understood, illustrated wherever possible, & include specific details for each appliance, such as schedule of periodic maintenance & repair instructions.

Regulations -37:- Muster list & emergency instruction - details what the muster list should include, The muster list should: specify details of the general alarm & public system; show the duties assigned to each member of the crew, such as closing of watertight doors, muster of passangers; specify which officers are assigned to ensure life-saving & fire appliances are maintained & ready for use; the muster list must be prepared before the ship proceeds to sea.

C) BASIC FFA REQUIREMENTS:-

Refer to SOLAS Chapter II-2, Part B, (regulations 23 to 1) which deals with Fire Safety measures for passanger ships.

- Regulation 23 - Structure
- Regulation 24 - Main vertical and horizontal zones
- Regulation 25 - Bulkheads within a main vertical zone
- Regulation 26 - Fire integrity of blkheads and decks in ships carrying more than 36 passengers
- Regulation 27 - Fire integrity of bulkheads and decks in ships carrying not more than 36 passengers
- Regulaton 28 - Means of escape
- Regulation 28-1- Escape routes on ro-ro passenger ships
- Regulation 29- Protection of stairways and lifts in accommodation and service spaces
- Regulation 30 - Openings in"A" class divisions
- Regulation 32- Ventilation systems
- Regulation 33 - Windows and side scuttles
- Regualtion 34 - Restricted use of combustible materials
- Regulation 35 - Details of construction
- Regulation 36 Fixed fire detection and fire alarm systems and automatic sprinkle, fire

detection and fire alarm systemsassociates valve, pipelines, Gps are in order Replace foam concentrate before its expiry date.

11. Fire Detectors : Smoke /heat/ flame type detection sensors to be checked weekly at different Iocation. Defective unit to be replaced immediately. Ensure that all accommodation doors and associated machinery is stopped when fire alarm is activated.

12. W/T Door-: W/Tto be operated weekly Grease it well and ensure its proper functioning.

13. Emergency steering Emergency steering to be tested regularly. The ship is underway and same to be logged in deck & equipment log book.

14. Local Starting of M/E : If ship[is local starting/stopping of the engine is to be done regularly.

15. Portable extinguishers Extinguishers are to be maintained in good condiations Changes are to be replaced at the expriy date. Nozzle and hose should be kept in good conditions.

16. CABA/ELSA set : Should be maintained in good condition. Check all parts are funcational. Various accessories are in good conditions Boats and fire drills are to be conducated at frequent intervals. Opportunity to be arranged to train Juniors or newly formed ratings in handling / operating various types of extinguishers

Each crew member should have the practical knowlege of operating lifeboat engines and emergency fire pipes. Proper boat and fire drills are to be conducted and detailed description of the drill to be written. Safety committee meeting to be held once a month and any accidenat / near misses to be discussed In detail and corrective / preventive action taken to be mentioned in the report.

Amendments to the international convention for the Safety of life at sea, 1974 resolution MSC 47(66) aopted on June 41996.

Chapter 7

CASE STUDIES OF SOME DISASTERS

HERALD OF FREE ENTERPRISE

- Zeebrugge to Dover with 80 crew, 500 passanger (estimted), 84 cars plus 42 lorries, March 6, 1987.
- I mile outside Zeebrugee, listing to port, swinging to starboard, within 90 seconds , vessel capsized
- Loss of 193 men, women and children
- Rescue services reached the scene of the disaster within 15 minutes
- Too late for the 38 crew and 155 passangers who were trapped on board.
- Approx, 400 survived
- Blame - bow doors were still seawater on car deck affecting her stability person responsible for closing bow doors asleep, did not attend to his duties, no countercheck by any other person.
- Persons on bridge did not wait for report that bow doors were closed.
- No indicator on bridge to show bow doors not closed.
- After the accident, bow and stern door monitoring fitted on all vessels

During the evening of March 1987, the British ro-ro motor ferry, Herald of Free Enterprise capsized off the part of Zeebrugee, with loss of life of 193 men, women and children. The vessel was operated by Townsend Car Ferries.Built in 1980, the vessel sailed from Zeebrugge at 7 p.m. on March 6, bound for Dover with 80 crew, 500 passengers (estimated) and 84 cars plus 42 lorries. Many passengers were day-

trippers returning from a day out in Belgium.

About a mile outside the harbour, the vessel began listing progressively t port while swinging to starboard. Within 90 seonds, the vessel had capsized and settled on her beam on the sea bottom, facing the way she had come. Water flooded into all decks, and the ship quickly became two thirds submerged. Rescue services reached the scene of athe disaster within 15 minutes but it was already too late for the 38 crew and 155 passangers who were trapped on board. The fact that approximately 400 survived due to the reason that the vessel had settled on a sand bank as the she turned over. The relatively high number of people who escaped owed their lives to the skill, courage and discipline of the crew. The heroism of individual passengers and the efficiency of the international rescue teams from Belgium, the Netherlands and Britain, some of whom actively rescuing passengers just 15 minutes after the disaster Blame for the tragedy was put on the fact that the bow doors were still open when the vessel was clear of Zeebrugee harbour enabling tonnes of seawater to pour into her car deck and thererby affecting her stability.

The person responsible for closing the bow doors had fallen asleep, and therefore did not attend to his duties. There was no countercheck by any other person. Personnel on the bridge did not wait for a report The person responsible for closingthe bow doors had fallen asleep, and therefore did carried out his not duties. There was no countercheck by any other person, Personnel on the bridge did not wait for a report to tell them the bow doors were closed. There was no indicator on the bridge whereby the bridge team could see that the bow doors were not closed.

After the accident, bow and stem door monitoring indicators have been fitted on all vessel operated by Townsend Car Ferries.

SCANDINAVIAN STAR

Oslo-FREDERIKSHAVN April 7, 1990, 395 passengers, 98 crew, 50 cars 18 trucks Lives of 158 men women and children including 16 crew were lost. Some passengers and crew took to the life boats.

Master suspected arson 5 fires earlier quickly put out by passengers & crew. Norwegian police stated - convicted Danish among 158 who died Capt. Larsen broadcast instruction in Norwegian and English Passengers to remain clam and make their way to the lifeboats Accurate count of casualties not made, as children <7 no on passenger list. 4 safety inspections in previous 3 months, made negligence difficult to prove Capt. said fire alarms worked perfectly, some survivors stated the contrary. Investigations showed that many doors did not work and one was missing, gates across ventilator shafts were found open after the fire.

Chief Engineer - fire doors inspected regularly were in good working order. 80 crew new to vessel, many Portuguese Pilipino, language ?

Materials on surfaces onboard produced toxic gases, the main reason that most of the 1158 victims died.

Doctors' observations most passengers perished shortly after the fire broke out. Police filed cases, director of the company for putting the vessel into services for commercial reasons without spending enough time to train the crew and check her safety equipment. Master received jail term of 6 days, while the other two had to serve 40 days each.

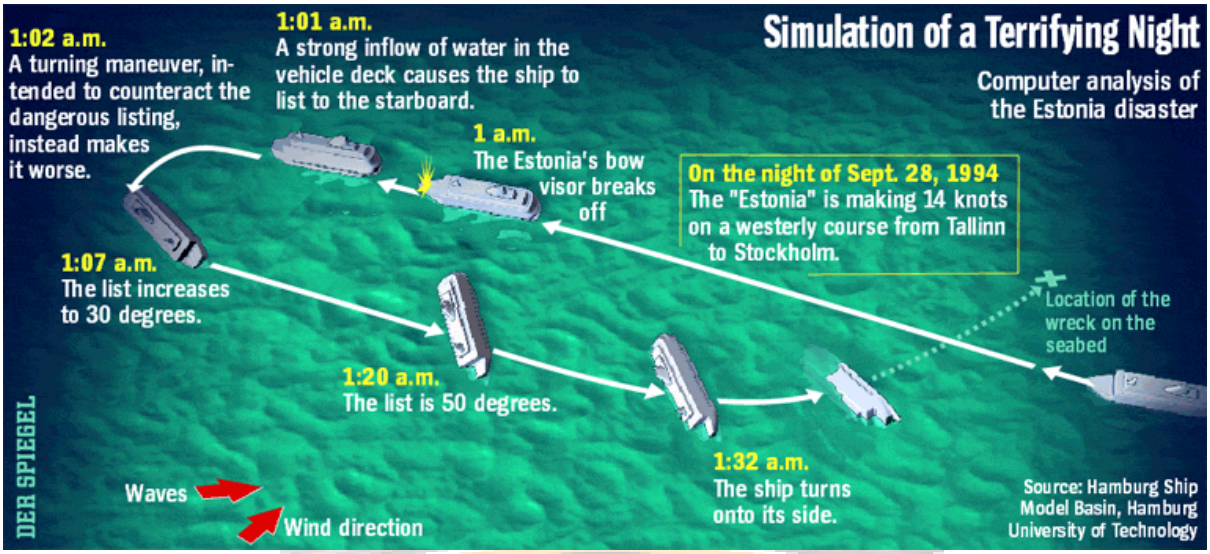
A major marine casualty of 1990 in terms of cost of lives and media coverages was that of the fire on the Bahamian ro-ro motor ro-ro motor ferry the Scandinavian Star. The lives of 158 men women and children, including 16 crew were lost.

The vessel was enroute from Oslo to Frederikshavn on April 7, 1990 with 395 passengers, 98 crew and about 50 cars, 18 trucks. The vessel caught fire in the early hours of the 7th while in calm sea in the Skagerrak. Some passengers and crew took to the lifeboats while others were picked up by the Stena Saga. Some were air lifted by Norwegian, Swedish and Danish helicopters.

The Master of the vessel suspected arson, as there were two fires that were quickly put out by the passengers and the crew. (It was later by the Norwegian police that a convicted Danish arsonist was among the 158 people who died in the fire) However, the third fire spread rapidly and got out of control. A large concentration of piled victims was found on the restaurant deck. Scorched cabins revealed whole families huddled together, with an unexpected number of childeren. An accurate count of the casualties could not be made as children under the age of seven were not included on the passenger list. The vessel had four separate safety inspectins during the previous three months, and this made neglidgence difficult to prove. Capt. Hugo Larsen stated that the fire alarm bells worked perfectly, through some survivors stated the contrary.

When the first two fires were put out, and the third fire took hold, Capt. Larsen broadcast instructions in Norwegian and English for the passengers to remain calm and make their way to the lifeboats. Investigations showed that many doors did not work and one was missing. Gates across ventilator shafts were found open after the fire, though the vessel's chief engineer stated that the fire doors were inspected regularly and where in good working order. It was also found that approximately 80 of the crew were new to the vessel and many of them were Portuguese and Philipinos, and there had been a language problem. Materials used on the surfaces on board produced toxic gases, and this was believed to be the main reason why most of the 158 victims dies during the fire. Monoxide gas from burning plastic laminate was produced in large quantities. Purussic acid smoke was also produced. Prussic acid is dangerous at low temperatures but is later eliminated when the fire catches on and the temperatures rise. The doctor's observations coincided with this, as most passengers who died appeared to have perished shortly after the fire broke out. Police filed cases against the Master, a majority shareholder, and a director of the company for putting the vessel into service for commercial reasons without spending enough time to train the crew and check her safety equipment. Capt. Larsen received a jail term of 60 days while the other two had to serve 40 days each.

ESTONIA



- 28.9.94, Tallin - Stockholm, 858 pass. 191 crew, 28 trailor, one bus plus private vehicles, 912 persons were reported to have perished

- Of 912 missing, only 93 bodies recovered, 819 missing

- 137 survivors - 25 women, I child and 25 crew non of whom were officers.

- Victims comprise Swedes, 163 Estonians, and 29 Latvians.

- Water temperature was 8 degree C and the maximum survival time was one hour.

- 85 persons died in lifeboats, in the sea clining to wreakage, or with life jackets.

- Cause- ripping off of the bow door, causing the car deck to flood

- Capsized almost 90 degree to starboard with a peak to through wave height of nine meters, sank 20 miles SSE of the Finnish up to island pilot station

- Wreck later found in 80-m water with bow door ripped off, lying one west of the wreck.

- Many rescue vessels including five ferries and two cargo vessels

- Eighteen helicopters from Finland, Sweden and Denmark

- Bow visor had smashed into the inner watertight bow doors of the ferry.

- Joint commission found failure dof bow visor mechanism triggered disaster.

- Initial failure of bow visor occured when its three locking systems failed simultaneously,

- Caused "uncontrollable movement" of the visor.
- Smashed into the inner doors, breaking them open before the visor fell off.
- Master slow to warn the passengers, crew and coast guard
- Crew member reported loud bang from the bow at 0040 hrs, crew alert sounded at 0120 hrs
- Doubtful if passenger received any comprehensible warning at all.
- Basic design parameters of bow door miscalculated and the door was of an unsuitable design.
- Meyer Werft, accused master, crew of delays in response measures, errors of judgement
- Shipyard accused Estlinge and operators Nordstrom & Thulin of slack maintenance and repair
- 55 tonne bow visor rested on a 200 mm x 60 mm stempost.
- Alleged stempost and connection to hull fractured before accident, probably due ice damage.

- Anders Bjoekman - bow visor did not cause disaster - vessel was damaged below the water allowing water to leak into the lower decks.

In 1994, the worst maritime disaster since world war two struck Europe with the loss of the Estonia passenger ferry the Estonia. A total of 912 persons were reported to have perished when the 1980 built, 21,794 GT vessel capsized and sank in a storm in the Baltic Sea, during the early hours of September 1994. There were 137 survivors from among the 10449 men women and children on board of which 858 were passengers and 191 were crew. The vessel also had on board 28 trailers, one us and number of private vehicles, of the 912 missing. Only 93 bodies were recovered, leaving 819 missing. Of the 137 rescued, there were 25 women, one child, and 25 crew, none of whom were officers. The victims compromised 552 Swedes, 163 Estonia and 29 Latvians The water temperature was 8 degrees C and the maximum survival time was one hour. 85 persons died while awaiting rescue in water logged lifeboats or in the sea clinging to wreckage, or with life-jackets.

The cause of the disaster was reported to be the ripping off of one bow door, causing the lowerr deck to flood. The Turku Rescue Co-ordination center received a MAYDAY at 0124 hrs Finnish local time, on Sept.28—"We now have bad problem. Bad list. I think about 20 degrees to 30 degrees list." The vessel also reported that she had a blackout. There was no communication from the vessel after 0131 hrs. The

Total survivorestmated > 100 children.

275 bodies recovered, plus 26 survivors. 24 from Donna Paz, 2from Vector

Not on passenge lists - people with complimentary tickets, children below four years who get free passage, people who buy tickets on board, extra tickets bought illegally at cheaper rate with fares pocketed by crew. A15yearold survivor-no lights. No life vests, and orders being given. Another survivor stated that the cabinets containing the life vests were locked.

26-survivors picked up by Don Claudio whose Captain reported seeing flames as high as ten - story building.USAF copters-no-survivors,no debris

Dona Paz had no radio, and hence no distress messages were sent out. Maritime officials did not learn of the casualty till over eight hours had passed. 8 hrs to organise SAR operations.

Director of Manila SAR center's office learnt of collision at 7 am on Monday, 9 hrs later.

Authorities blamed poor comminications, geography, lack of organization, shortage of trained personnel, inefficiency, lack of finances, and a number of other reasons for what was described as the frequent foul-ups in Phillpines maritime operations.

Senior coast guard officials dismissed, commanders in 4 districts replaced, 16 others re-assigned for Negligence.

Violation of the statutory procedure clearances to ferries.

On April 22,1980,100 lives, identical collision, Don Juan - tanker Tacloban City.

Dona Paz - Vector collision occured just 40 mites from the scene of the earlier collision. President of Phillipines Shipyard and Engineering Corporation claimed more than 40000 deaths at sea in the Phillipines, Authorities stated 2000-30000 only! In 1987, 11 million people were manifested on Phillipines local ferries!

The world's worst ever peace-time maritime disaster occured during the late evening (10 p.m.) of December 20, 1987, when the 2324 GT Philipines inter-island ferry Dona Paz enroute from Tacloban, Leyte Island, to Manila, collided with the 629 GT Vector in the Sibuyan Sea, central Philippines. Both vessels immediately caught fire, were completely gutted, and sank in a depth of 530 meters. A total of 4386 men, women and children lost their lives. The Dona Paz was reportedly hit by the motor tanker Vector in the Tablas

strait off Dumali point, eastern coast of Mindoro island, in the busiest sealeane in the whole of the more than 7000 island Philippin archipelageo.

The Vector had a crew of 13. and carrying 8800 barrels of petroleum products. Authorities stated that the Dona Paz had 1586 manifested passengers and 58 crew on board. However, there were 2755 un- manifested passengers. One survivor estimated that there were over 1000 children on board. Only 275 bodies were recovered, besides the 26 survivors, Dona Paz and 2 from Vector. Names of people with complimentary tickets, children below four years who get free passage, and those who buy tickets on board were not included in the passenger manifest. Extra tickets were usually bought illegally on board at a cheaper rate with the fares being pocketed by the crew. The vessel was so overcrowded that up to four people were sharing one bed with hundreds sitting on the floor.
A 15 year old survivor who jumped into the burning sea stated that there were no lights, no life vests, and no orders being given. Another survivor stated that the cabinets containing the life vests were locked.
The 26 survivors were picked up by the Don Claudio whose Captain, Melecio Barranco reported seeing flames as high as a ten story building, and lots of black smoke. United States Air Force helicopters that subsequently went to the scene found no survivors, and no debris

The Dona Paz had no radio, and hence no distress messages were senst out. Maritime officials did not learn of the casualty till over eight hours had passed, and it took another eight hours to organize search and rescue operations. The director of the Manila search and rescue co-ordination center's office learnt of the collision at 7 am on Monday, nine hours later.

Authorities blamed poor communications, geography, lack of organization, shortage of trained personnel, inefficiency, lack of finaces, and a number of other reasons for what was described as the frequent foul-ups in PHILLIPINES maritime operations.

Senior coast guard officials were dismissed, coast guard commanders in four districts were replaced, and 16 other officers were re-assigned after negligence in the coast guard organization was found to be a contributory factor to the tragedy. It was found that there was a violation of the statutory procedures for granting departure clearances to ferries.

On April 22, 1980, over 1000 lives were lost in an identical collision, when the ferry Don Juan collided with the oil tanker Tacloban City. The Dona Paz- Vector collision, whenoccurred just 40 miles from the scene of the earlier collision.

Then it was claimed by Feliciana Salonga, president of the Philipines Shipyards and Engineering corporation that there were more than 40000 deaths at sea in the Philippines, the authorities s