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CHALLENGES OF CROWD MANAGEMENT ON PASSENGER SHIPS

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Abstract. There are big differences between the emergency situations happening onboard the same type of ships and of course between different types of passenger ship.

However, when accident investigation reports of passenger ships have been reviewed, some of these accidents have had impressive consequences regarding saving lives and minimizing the number of causalities. On the other hands, some of such accidents have had disastrous consequences.

According to STCW convention and HSC code, all crewmembers of passenger ships shall have special training on passenger safety and crowd management. These special vocational courses are designed to provide passenger ship`s crew with necessary information that supposed to be sufficient to provide them with adequate proficiencies and experiences and required to be acquainted with the techniques of controlling and management of passengers during emergency situations.

STCW requirement only considering how ship`s crew can handle passengers but not how crew can handle and control their emotions and feelings which of course affects their response as human during emergency situations.

This paper aims to emphasize the challenges facing passenger crew during emergency situations and how to control the crewmembers' emotional and behavioral responses by training, these will be accomplished through:
– Investigate the most famous passenger ships accidents.
– Analyzing the consequences of each accident and the behavior of crew
– Compare between such successful and failed cases
– Studying the human emotional and behavioral
– Review the minimum training standards provided responses during emergency.

Key words: passenger ships, crowd management, maritime safety, crew qualifications

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1 INTRODUCTION

Emergencies can occur on even the most modern passenger ship. Only a well-trained crew can mitigate the effects of such an emergency and take care of passengers through good organization. Crew qualifications and proficiencies shall not depend only on theoretical training on how to manage crowd deal with different emergencies, as required by STCW convention and HSC code. However, crew of passenger ship especially those in command shall have special psychological training and mental strain control training to control themselves first before controlling others behavior.

Carrying passengers at sea is considered as one of the hardest tasks assigned to merchant ships to carry and that require special trained crew supported with very special competencies in particular decision-making. However, when passengers were considered as a kind of cargo carried seaborne, crew and passengers as human has the ability to think and accordingly, they will be able to react to the frequent changing events around them.

On this basis, they have different responses and attitudes to the developing events, these reactions are vary significantly according to persons' culture, knowledge, age, gender, purpose of the trip and whether alone or with their families.

Recently, passengers sea transportation has dramatically evolved, the sizes of ships and number of passenger carried on board has been significantly increased. Accordingly, the number of crewmembers increased and their responsibilities strongly differed and varied.

Crowd Management (During Emergencies)

The crowd is seen as a large group of individuals in the same physical environment, sharing a common goal (e.g. transport from place to place or to have fun and pleasure).

In short, Crowd Management is the task to assist passengers in an emergency situation, to lead passengers in staircases, corridors and passages; to use procedures for preventing panic and other irrational behavior and to communicate with passengers. The crewmembers shall perform all the above mentioned tasks with high proficiency and discipline.

Bengt Schanger (2012), defined Crowd Management as "the systematic planning for, and the supervision of, orderly movement and assembly of people during emergency. Crowd management involves the assessment of people and handling capabilities of the ship. It includes evaluation, based on information available. It includes projected levels of occupancy, adequacy of means of ingress and egress, processing procedures such as evacuation, and expected types of human behavior".

Crowd Control (During normal situations)

Crowd Control is the controlling of a crowd during normal situations, to prevent the outbreak of disorder and prevention of possible riot. Examples are during passengers` embarkation and disembarkation in normal conditions.

Crowd Management means on board Passenger Ships

There are two basis for managing crowd on board ships as follows:

a) The Passive Crowd Management (indirect)

Passive Crowd Management methods means the proactive actions and measures taken to ensure smooth flow of passengers onboard and prevent any misunderstanding and ambiguity regarding correct directions of flow, preventing congestions and providing good communication channels. These requirements are regulated by safety standards and requirements regarding safety construction like SOLAS Conventions and training standards as STCW Convention; including the following:

- **Management of the Hardware:**
  – The structure and design specifications of scape roots, alleyways, and muster stations
  – Alarm systems
  – Markings of escape routes
  – Low Location Lighting systems
  – On-board communications and alarm systems
  – Public address systems on passenger ships
  – Arrangement of Means of Escape
  – Emergency source of electrical power
  – Emergency lightening system
  – Survival craft muster and embarkation arrangements
  – Marking of escape routes

- **Management of the Software:**
  – According to IMO, (2007) Conduct evacuation analysis for new and existing passenger ships, including:
    a. Typical population- male, female, young, old, mobility impaired
    b. Some parts of escape routes may be unavailable
    c. Cognitions availability due to passenger behavior
    d. No dead-end corridors no lock doors in direction of scape
    e. Two escape routes from every space- one fire protected

- According to IMO, (2005), the evaluation of evacuation analysis of the High speed passenger craft are as follows:

  a. Description of the system

  b. Identification of assembly stations.

  c. Identification of embarkation stations, MES and survival craft.

  d. Description of the evacuation procedure including the role of the crew.

  e. Identification of groups and their escape route.

- Decks are sequentially numbered

- The cabin numbers increase from the aft to the forward end of the ship to provide horizontal awareness

- Simple mimic plans showing the "You are Here" position

- Escape routes marked by arrow prominently displayed on the inside of each cabin door and in public spaces

- Written instructions informing passengers what to do in case of emergency

- Instruction for safe escape

- Muster list and emergency instructions

- Decision support system for masters of passenger ships

- Information on passengers

- **Management of Human-Ware:**

  - Emergency and abandon ship drills

From the first of January 2015 passengers shall undergo safety drills, including mustering at the lifeboat stations, before the ship departs or immediately on departure, and makes mandatory on emergency training and drills the carrying out of enclosed-space entry and rescue drills, which will require crewmembers with enclosed-space entry or rescue responsibilities to participate in an enclosed-space entry and rescue drill at least once every two months.

- Crew Training – STCW requirements

As required by the STCW convention, masters, officers and other personnel who are designated on Muster Lists to assist passengers in emergency situations on passenger vessels have to complete approved training on crowd management and these include very common subjects. The required training course has duplications with survival techniques course on the following subjects: life-saving appliances and control plans: Muster lists and muster stations, emergency alarms (general emergency, man overboard, abandon ship), launching of survival crafts and the proper donning of life jackets. Also, mustering procedures: Preparation and launching of equipment, staff assignments, custody and use of communication equipment, manning of fire teams, etc. Operational limits: Ship's layout (exits, stairwells, elevators, etc.), power failures, emergency lighting. Emergency procedures.

However, the course only include guidelines for assembling passengers, conducting a vessel search, keeping order and discipline, leadership skills.

Communications: Alarms, language barriers, clear and reassuring orders, rumor control, anxiety, special assistance for the disabled, communicating with the bridge. From the above demonstration, it is obviously indicated that items included in crowd management training are very much shallow and need much more modifications to include how to prepare candidates to psychotically manage their behavior first before managing passenger behavior and others.

b) Positive crowd Management (Direct) Way

This means the Crowd Management Techniques, Behavioral Management and Time Management.

Experience from previous passenger ships accidents

The following table indicates the most famous passenger ships` accidents and analysis of the crew behaviour and the resulted causalities:

Ship's name	Accident description	Crew behaviour	Learned Lessons
Titanic (1912)	Weather was clear Ice warning received hit iceberg and sank	Prior to the Titanic disaster people were led to believe that the ship was unsinkable, conditioned to this belief, many people react accordingly and denied that the ship was in danger of sinking.	"Prior conditioning will affect how people may react during emergency
MS Estonia (1994)	Ship sank due to bad weather	The general emergency alarm not given until about five minutes after the list developed, nor was any information given to passengers over the public address system. By the time the alarm given, the list made escaping from inside the vessel very difficult. This, together with problems in using life-saving equipment contributed to the tragic outcome.	The delay of sounding emergency alarms may result in disastrous situations

Ship's name	Accident description	Crew behaviour	Learned Lessons
Al Salam 98 (2006)	Sank due to fire and free surface effect	Survivors said that the ship's captain, had insisted on continuing on to Egypt, 110 miles away, after a fire had broken when the ship was just 20 miles off the coast of Saudi Arabia. He and his crew had reportedly not merely ignored the appeals of passengers to turn around, but had locked some in their cabins. Some passengers apparently remained asleep. Some said that crewmembers had prevented them from wearing lifejackets. Survivors said many of the passengers were trapped in lower levels of the ship and would not have made it out before it disappeared into the water.	Loss of crew control gives passengers the right to start control themselves, give orders and deny crew instructions
Explorer (2007)	MS/ Explorer hit an iceberg off Antarctic	Ppassenger from cabin 314 said that while at the muster station, Expedition Group were telling jokes to keep the passengers calm. He said he felt the situation was more serious than they being told and did not appreciate jokes.	Crew appearance and mod will be copied to passengers
Costa Concordia (2012)	Extreme list	Witnesses reported that the crew left it until the very last moment to begin boarding passengers onto lifeboats. As a result, precious time was lost, and in the panic people began jumping into the water. The longer they left it to launch the lifeboats, the worse the ship was lifting in the water. People seemed to be trapped in the decks on the side of the ship that was under water. "While we were still in the dining room, the crew basically disappeared, and it was left to a few Thai waiters who didn't speak English to try to keep us calm.	If the crewmembers haven't proper training and not skilled enough, the first thing to do is to disappear

Source: Information are extracted from the accident investigation reports

Difficulties facing crewmembers during managing crowd on passenger ships

When a person finds himself in a crowd during unknown emergency he or she will behave on one of the following types of Crowd behavior:

– Passive crowds (spectator crowds)

– Active crowds,

– Hostile crowds ("mobs"),

– Escape crowds ("panic"),

– Acquisitive crowds ("crazes") and

– Expressive crowds ("mass hysteria").

Crowd behavior in ship accidents will be dependent on:

– The nature of the accident and the circumstances it produces for escape (visibility, smoke, list, flooding etc.),

– The level of information given by those in command,

– The perceived risk,

– The family context and the time available for escape.

The following are brief description of some difficulties facing crew in handling crowd onboard passer ships, these mainly extracted out of the most famous accidents:

a) Psychological impacts on passengers and crewmembers

We always try to Manage Situations not passenger Behavior so we failed to Manage Emotions then Responses. Many of the actions taken by those responsible for the safety of passengers on a ship are based on incorrect assumptions about how passengers will behave in an emergency.

Harbst and Madsen (1995) indicated that, when an emergency arises, passenger bbehavior will be similar to the following model:

– 10% of people will accept that there is danger

– 30% of people will look for further evidence of danger

– 60% of people will initially ignore the signs of danger

However they illustrate the likely actions of people once they have accepted that a dangerrous situation exists:

– 10% will attempt to evacuate

– 5% will attempt corective action

– 10% will attempt to worn others

– 60% will wait for instructions or look for other intiatives

– 12%-14% will become baralysed and take no action

– 1%-3% will panic.

During emergency number of people onboard (passengers and crewmembers) will tend to ignore an unexpected event in the hope that it will go away itself. This reaction appears to be particular strong upon involved in risky situation and then lead to panic.

Patient (2014) defined panic attack as a severe attack of anxiety and fear which occurs suddenly, often without warning, and for no apparent reason. In addition to the anxiety, various other symptoms may also occur during a panic attack. These include one or more of the following:

– A thumping heart (palpitations).
– Sweating and trembling.
– Dry mouth.
– Hot flushes or chills.
– Feeling short of breath, sometimes with choking sensations.
– Chest pains.
– Feeling sick (nauseated), dizzy, or faint.
– Fear of dying or going crazy.
– Numbness, or pins and needles.
– Feelings of unreality, or being detached from yourself.

George S. Everly (2008) also added that there are many of body reactions designed to enhance physical survival when confronted by a life-threating situation for prolonged periods. Problem can arise in a host of bodily systems yielding results such as increasing the serum lipids, irregular heart rhythms, headaches and impulsiveness.

Causes factors of panic

There are many reasons might leading to panic such as:

– Lack of training/understanding
– Level of panic is directly proportional to the level of danger and behavior of the leader and his followers.
– Failure to issue reasonable orders.
– Conflicted orders and decisions.
– Ignorance of what is currently happened.

Roberts (2000) explained that when People caught in a disaster or extreme mess appear to follow a set pattern of psychological responses. The pattern is similar irrespective of the disaster. There are several characteristics of individuals currently going through a crisis or traumatic event:

– People first begin to recognize that there is a threat.
– Next, these individuals discover that the stress and trauma of the event cannot be dealt with using existing coping skills.

– People then begin to experience fear, confusion, and stress.
– Those facing a crisis begin to exhibit symptoms of distress and discomfort.
– Finally, people enter a state of imbalance where the crisis situation seems insurmountable.

To assist in differentiating between panic and stress Peter Ockerby (2001) categorized behavior into two categories: coping and non-coping. Panic is associated with non-coping behavior while stress is associated with coping behavior.

Coping behavior	Non-coping behavior
Attempt to solve problem	Makes no attempt to solve problem
For examples: – Raise the alarm – Remove the threat – Move rationally – Consider others	For examples: – React emotionally – Become hostile – Withdraws

b) "group-binding"

Svein Kristiansen, (2013) "defined the concept of group-binding" as people both rationally and emotionally have an interest in finding their relatives before being evacuated. As a consequence of group binding some passengers will break away from the crowd, and they can subsequently be subject to way-finding errors. In the event of an accident on a passenger ship that results in a decision to muster the passengers, group binding will initially be encountered by the crew in the form of noncompliance with instructions.

Some passengers will refuse to leave a particular place, where they had an agreement to meet again with relatives, and other passengers will refuse to go directly to the assembly station because they want to search the ship for their relatives

If people enter the ship as a group then they will want to evacuate as a group. People will often spend time assembling before evacuating, and then they will only move as fast as the lowest member of the group. In a real accident parents cannot be trusted to comply with instructions from the crew, if they are separated from their children (or elderly family members).

c) High turnover of seafarers

The ITF (2015) indicated in its "cruise ship safety" policy that one of the current problems within the cruise ship industry is the high turnover of seafarers. It is not uncommon for the average turnover rate to be between 25% and 35% per year and this has considerable implications for the implementation of the ISM Code and the safety of the vessel. Consideration should therefore be given to measures which will make the industry more attractive and thereby reduce such unac-

ceptably high turnover rates. One such measure would undoubtedly be to professionalize many of the positions and functions through the adoption of formal qualifications and certification requirements.

d) Most of passengers on cruise ships are elders and need special care

For assisting passengers with special needs in an emergency, an adequate number of seafarers should be specially trained and provided with suitable documentary evidence to attest to the fact that they have been adequately trained in the evacuation of passengers with special needs. As the ITF considers all the personnel employed or engaged on cruise ships as seafarers, it goes without saying that they should receive appropriate training.

e) Selfish behaviours – pushing, trampling

During emergency situation everyone including crewmembers needs to survive and save his or her life. Despite the crewmembers main roll on board is to lead passengers out of their cabins through stairways to the embarkation deck, but in many situation we find crews were in front of passengers racing to survive and embark the survival crafts. During emergency, if there was only one device could help in rescue one person of two, both of them think that he or she has the right to have it and survive.

f) Inconvenient surrounding atmosphere

During emergency situations it is probable to have the ship out of main source of electrical power and only emergency lightening system in operation which is normally faint light and not enough for passengers specially elders to find their way out of their cabins. Normally fire emergencies were accompanied with smoke which reduce visibly or enforce passenger to close theirs eyes and knee down to the ground. In addition, during emergencies which involves inrush of water into the ship and flooding, the ship will sustain a list to one side which will prevent many of passengers to move freely.

g) Bad weather and ship movement

During emergency accompanied with bad weather the situation always become worse because of ship movement and all operations have to be carried out performed in a harry. Passenger always have got seasickness and cannot even stand up or move.

h) Security of passengers

It may be the case of instability that comes with emergencies on ships a well-suited environment for, evils to revenge, theft or to get rid of their enemies and might leads to violence and Disobedience.

i) Different nationalities and cultures

Passengers transported to different places always have different languages and cultures as well. They always carry heavy luggage and may be cargo as personal items. During emergency, they might need to carry their luggage with them when evacuated to the survival craft or need to go to luggage store room or the garage to chick their belongings.

In fact the problem of multinational not only with regard to passengers but also concerning crewmembers, multinational crew always have no interest and intention to lost their lives to save others life so, they always evade any danger and behave the same way as passengers. In facts, they only need to serve passengers and earn money out of these.

j) Wrong decision making

Despite the fact that, the ship master is the only one who can take crucial decisions on board, but his/her decisions depends mainly on his/her long experience in this field, which of course differ significantly from master to another. Therefore, in the case of passenger ships which carry large number of persons and the ship` captain of course is confronted with very stressful situations, there is a need to train masters of passenger ships on decision making under mental stress techniques, Strategic Leadership: The Essential Skills and Emotional Intelligence and Self-Management.

k) Passengers always have no faith on crewmembers

Passengers must have faith in the crewmember on the basis of their uniform and their respectable behavior. However, during emergency situations, some of passengers look at crewmembers as they are the reasons behind their sufferings and torments because of their faulty decisions and reactions. If crewmembers lost their authority due to bad management, lack of communication with stakeholders, showing lack of proficiency or being psychotically affected by the situation, passengers will refuse to obey their instructions and start to search for alternative leader among them and start following him instead.

m) Bad arrangement and distribution of cabins

Hundreds of cabins are located at the seaside of the ship, but thousands of them already located internally within a sophisticated network of cabins. For a normal passenger, during emergency, it will be impossible for him to leave his cabin and find his way out to the wright direction leading to the correct muster station, because it is very difficult for passengers to do this the wright way during normal conditions of lightening, good visibility and stable ship.

n) Insufficient number of the crew

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 behavior by the crew.

o) Loss of communication channels

Crewmembers might lose their channels of communication with the bridge, if they are late in understanding or hearing instructions and information or standing in blind sectors out of rang. On the other hand, crewmembers might lose their channels of communications with passengers because of languages difficulties. Under stressful situations, everyone starts to talk his own native language and express his intentions accordingly.

CONCLUSION AND RECOMMENDATIONS

Carrying passengers at sea considered one of the hardest tasks assigned to merchant ships to carry and that require special trained crew supported with very special competencies in particular decision-making.

During emergency situation everyone including crewmembers needs to survive and save his or her life. Despite the crewmembers main roll on board is to lead passengers out of their cabins through stairways to the embarkation deck, but in many situation, crews were in front of passengers racing to survive and embark the survival crafts.

If crewmembers lost their authority on the passengers due to bad management, lack of communication with different parties, showing lack of proficiency or being psychotically affected by the situation, passengers will refuse to obey their instructions and start to search for alternative leader among them and start following him instead. Therefore, in the case of passenger ships which carry large number of persons and the ship` captain is confronted with very stressful situations, there is a need to train masters of such passenger ships on decision making under mental stress techniques, Strategic Leadership: The Essential Skills and Emotional Intelligence and Self-Management.

For the above considerations, it is recommended that:

a. Those people who have responsibility for the safety of passengers in an emergency on a passenger ship should have appropriate proficiency and competences on how to behave and control their emotions.

b. Responsible persons on board passenger ships should have practical training on handling crowd situations under the influence of abnormal working environment like ship under extensive list of trim, smoke, and restricted visibility.

c. People with the responsibility for notifying passengers that an emergency or potential emergency exists must consider that the use of an alarm in isolation is unlikely to ensure an effective evacuation. Passengers need more than one cue before they will take the situation seriously so alarms must be supported by public address announcements and directions from uniformed ship`s crew.

d. Where there is any doubt about the seriousness of an emergency, or when all facts are not well-known, preparations for evacuation should begin. This does not have to mean a full scale evacuation of the ship but it should at least include notifying passengers and have them start to make their way to the easily stages of an evacuation could lead to a massive loss of life during the later stages.

e. Training of ship`s crew "Crowd management" according to IMO model course (1.28) should give much more strength to train crewmembers on handling stressful situations and avoiding panic and mental strain.

f. Evacuation demonstrations should be carried out with due concern for the problems of mass movement or panic acceleration likely to arise in an emergency situation when rapid evacuation is necessary. The evacuation demonstrations should be dry shod with the survival craft initially in their stowed positions.

g. Captains of passenger ships shall have mandatory special training in decision making under mental stress techniques, Strategic Leadership: The Essential Skills and Emotional Intelligence and Self-Management.

h. The worst situation a passenger ship can be confronted with, if there is a need to abandon ship during very bad weather. Therefore, researchers are asked to find alternative solutions for safe means of evacuation.

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