

## **Joining a cruise ship as Safety Officer**

First experience as an Safety Officer. Observations and implementations of safety systems

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Degree Thesis

Bachelor of Maritime Management

Degree Programme in Maritime Management, Captain

Turku 2022

## **DEGREE THESIS**

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Degree Programme and place of study: Maritime Management, Novia

Specialization:

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Title: Joining a cruise ship as Safety Officer

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Date: 19.05.2022 Number of pages: 39

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### **Abstract**

The aim was to describe the process of joining a cruise ship and starting to act as a safety officer for the first time during authors career. The Author had years of previous sea going experience as an 2<sup>nd</sup> and 3<sup>rd</sup> Officer on passenger vessels. Basic information about cruise ship hierarchy was studied together with ship's particulars. Cruise Ship Astoria Grande (ex. AIDA Cara) was built in Turku in 1996 and was bought by a Russian company in late 2021 from Costa cruises German subsidiary AIDA cruises. The new owners were new to cruising business, so all the safety management onboard had to be built from scratch. The journey took us from joining the ship and getting familiarized until implementing a fresh safety system onboard and monitoring it. Safety system was based on codes, laws and guidelines in force during that time.

The safety officer should familiarize himself with company policies, instructions and procedures relevant to his position and he acts as a Staff Captain's deputy, hence there were details describing that position.

The study can be used as guide for students or ship personnel, when they are making choices of their career path.

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Language: English

Key Words: Cruise ship, Bridge officer, Safety management

# Table of Contents

1	Introduction.....	1
1.1	Author’s certification .....	1
1.2	Research question and motivation .....	2
1.3	MV ASTORIA GRANDE Pilot card and particulars .....	2
1.4	Overlook of the contract .....	5
2	Cruise ship hierarchy.....	6
3	Safety officer job description .....	11
4	Familiarization .....	12
5	Muster list and emergency response plan.....	14
6	Emergency teams and emergency support teams .....	17
6.1	Command and Control .....	18
6.2	Technical control .....	19
6.3	Assessment team.....	21
6.4	Safety station team.....	23
6.5	Firefighting groups.....	27
6.6	Evacuation teams.....	30
6.7	Medical team .....	31
7	Conclusion.....	34
	List of Figures .....	38
	List of Tables .....	39
	References .....	39

## Abbreviation Glossary

M/S	Motor Ship
ECDIS	Electronic Chart Display and Information System
ARPA	Automatic radar plotting aid
OOW	Officer Of the Watch
GMDSS	Global Maritime Distress and Safety System
SHE-Q	Safety, Health, Environment and Quality
STCW	International Convention on Standards of training, certification and Watchkeeping for Seafarers
SOLAS	International convention for the Safety Of Life At Sea
SCBA	Self-Contained Breathing Apparatus
GT	Gross Tonnage
AB	Able Bodied seaman
M/S	Motor Ship
ECDIS	Electronic Chart Display and Information System
ARPA	Automatic radar plotting aid

# 1 Introduction

This thesis is written to give the reader an overlook of the life of a safety officer's job onboard a passenger ship. Safety officer is a regular senior officer position onboard but the author has no information that the Safety officer's life onboard is described this way before. This is the first time to the author to fill this position during his career. This thesis takes the reader from joining the ship, getting familiarized to creating and implementing a safety system onboard. It is not regulated how the implementing process should look like, only the outcome that is regulated by codes and laws and ship management procedures based on these laws. This is a portfolio type of thesis based on real life experience.

## 1.1 Author's certification

The author received watch officer license in mid 2017 and has been working ever since in Tallink Silja Line as an 3<sup>rd</sup> and 2<sup>nd</sup> officer on large RO-PAX ferries. Previous ships were m/s Megastar, m/s Star, m/s Silja Europa, m/s SeaWind, m/s Romantika and m/s Regal Star. Before officer rank the Author sailed in the same company as Able-Bodied seaman and deck cadet total seagoing experience about 12 years. During that seagoing time, he had sailed in the Baltic Sea, North Sea, Bay of Biscay, Mediterranean, Crossed the Atlantic twice and sailed through Panama Canal to the Pacific Ocean.

The author holds a OOW certificate of a ship 500GT and greater together with endorsement without limitations. GMDSS general operator certificate together with endorsement without limitations. Basic safety training certificate. Advanced firefighting certificate. Medical first aid and medical care certificate. Seaman medical fitness certificate. Crowd and crisis management certificate. Safety training for passenger ships certificate. Bridge resources management certificate. Proficiency of survival crafts, rescue boats and fast rescue boats. Use of ECDIS certificate. Use of Radar ARPA certificate.

## 1.2 Research question and motivation

Author is on his path to become a captain and this position requires lots of know/how and experience. Captain has the full responsibility hence he/she needs to be on top of everything that goes around the ship. Safety is number one priority. This paper explains the implementation of safety management onboard the ship and introduces the life of safety officer onboard. Safety officer is 3<sup>rd</sup> in command onboard after the staff captain. This research answers the question, that how is safety system brought to life onboard a cruise ship?

## 1.3 MV ASTORIA GRANDE Pilot card and particulars

Cruise ship Astoria Grande is nowadays a medium sized cruise ferry. During the year of construction it was large cruise ship. Largest cruise ship during that time was the Carnival Destiny that entered service that year, she had about 100 000GT. The ship particulars are shown on Figure 1. Based on this information we can see, that she has lots of powerful equipment onboard and manoeuvrability is good, but still needs a lot of time to crash stop or to make fast manoeuvres, this calls for good safety discipline on the bridge.

Date  19.08.2021	<h1 style="margin: 0;">PILOT CARD</h1>	
<h2 style="margin: 0;">Vessel: Astoria Grande</h2>		
Draught Aft 6.0m Fwd 6.0m    Deadweight: 3752t    Displacement: 19552t Year of built: 1996		
<b>SHIP'S PARTICULARS</b>		
LOA: <u>193,34</u> m                      Anchor chain:    Port <u>11</u> shackles                      Starboard <u>11</u> Shackles Breadth max. <u>32,60</u> m                      Stern <u>NIL</u> shackles Breadth mld.: <u>27,60</u> m                      ( 1 shackle = <u>27,5</u> m <u>15</u> fathoms ) Bulbous bow: <b>YES</b>		
Type of Engine:    Main Engines: 4 x MAN B&W 6L48/60    Power: 21720 kW (29512 HP) Auxiliary Engines: 3 x Wärtsilä Vasa 8R32D    Power: 8800 kW (11968HP)		
Manoeuvring engine order	RPM/Pitch	Speed (knots)
full ahead	152/10	21,4
half ahead	131/5	17,2
slow ahead	112/1.7	5,8
dead slow ahead	112/1	4,6
dead slow astern	127/-3	Time limit astern:                      NIL(CPP)    min
half astern	137/-5	Full ahead to full astern:                      55 sec
full astern	152/-10	Minimum RPM 112                      4,6 knots
		Minimum steering speed:                      3 knots.
		Astern power:                      50 % ahead
<b>STEERING PARTICULARS</b>		
Type of Rudder: 2 Independent flap rudders (L=1,8%LOA), h=draft) Maximum Angle: 45°		Hard-over to hard-over:
Rudder angle for neutral effect 0 °		4 Pumps    14sec
Thruster: Bow 2 x 1000kW (2 x 1360HP)                      Stern: NONE		2 Pumps    28sec
<b>CHECKED IF ABOARD AND READY:</b>		
Anchors <input type="checkbox"/> Whistle <input type="checkbox"/> Radar <input type="checkbox"/> 3cm <input type="checkbox"/> 10cm ARPA <input type="checkbox"/> Engine telegraphs <input type="checkbox"/>	Speed Log <input type="checkbox"/> Doppler: Yes/No Water Speed <input type="checkbox"/> Ground Speed <input type="checkbox"/> Dual-Axis <input type="checkbox"/> Compass System <input type="checkbox"/> Constant Gyro Error: +- °	VHF: <input type="checkbox"/> Indicators <input type="checkbox"/> OTHER INFORMATION: Elec. Pos. Fix. System <input type="checkbox"/> Rudder <input type="checkbox"/> Type: _____ RPM/Pitch <input type="checkbox"/> Steering Gear <input type="checkbox"/> Rate of Turn <input type="checkbox"/> Number of Power Units operating <input type="checkbox"/>

Figure 1 Pilot card of MV Astoria Grande(ship documents, Tschudi Ship Management)

On the following Table 1, we can see that the ship can take lots of passengers onboard together with a relatively large crew. Having a safe working atmosphere together with good safety practices is very important for the safety of every single soul onboard.

<b>Ship particulars Astoria Grande</b>	
<b>Ship data</b>	
Owner	Mester Commercial ltd
Operator	Tschudi Ship Management
Class registry	DNV
Flag	Panama
Call sign	3E3342
IMO number	9112789
MMSI number	352978227
Builder	Kvaener Masa-Yards Oy / Turku
Keel Laying	11.09.1995
Year built	1996
Date of Christening	07.06.1996
Yard No	1337
Ships Hull	100 A5 E1 IW ERS Passenger Ship with Cabins
<b>Weight</b>	
Gross tonnage	38557,0 t
Net tonnage	17766,0 t
Light Ship	15800,0 t
Deadweight (summerload)	3752,0 t
Displacement (summerload)	19552,0 t
<b>Main Dimensions</b>	
Lenght over all	193,34 m
L b.p.:	170,27 m
Beam moulded	27,60 m
Beam max.	32,60 m
Bridge wing extension	1,80 m
Max. Air Height (Keel to Mast)	46,00 m
Height from SWL to Wings	24,35 m
Air Draft (6,00m draught)	40,00 m
Draught (summer load)	6,00 m
Lateral wind Area (6,00 draught)	4785,00 m
Bridge to Bow	42,11 m
Bridge to Stern	151,23 m
Radar to Bow	56,54 m
Radar to Stern	136,80 m
<b>Machinery Data</b>	
Main Engines	4 x MAN B&W 6L48/60 21720 kW (29512 HP)
Auxiliary Engines:	3 x Wärtsilä Vasa 8R32D 8800 kW (11968HP)
Propellers	2 x controlable pitch propeller (outward turn.)
Bow Thrusters	2 x KaMeWa, each 1.000kW (1360HP)
Stern Thruster	No Stern Thruster
Max. Speed at SWL	21,4 kn
<b>LSA</b>	
Total Capacity	1708 persons
Total Capacity Passengers	1339 persons
Total Capacity Crew	369 persons
Total Capacity Lifeboats	1296 persons
Total Capacity Liferaft & MES	840 persons
PAX Cabins	590
Decks	12

**Table 1 MV Astoria Grande Particulars(ship documents, Tschudi Ship Management)**





**Figure 2 MV Astoria Grande in drydock after change of ownership (Kennart Kose, 2021)**

## **1.4 Overlook of the contract**

The portfolio thesis is constructed with the idea of following a 2-month contract of an Safety officer on a cruise ship. The contract contains joining the ship in Istanbul roads, where she was at anchor. The ship was freshly out of drydock after the change of ownership and was preparing for her first voyage. Safety Officer is a regular position on a cruise ship and was needed on Astoria Grande because the crew reached up to 100 people and 250 was expected to join in February. The cruises were expected to start in late March, but it was still open because of the COVID-19 situation.

After change of ownership, the previous owners deleted all the management system and only left important ship documents, hence all the system related to safety management had to be created on spot. Using the authors experience, this job was assigned to him. Author had to create Mustering and emergency response system that is adequate and fulfils the regulations set by technical management and the officials.

## 2 Cruise ship hierarchy

Like every other ship, there is a certain and fixed chain of command on board. Cruise ship's are little bit special, because there might be a lot of people on board who need service causing the crews to become large. When there is a large crew, then there are more needs for the crew as well, causing the crew to become even bigger. Every crew member has a position in this chain, ruled by the captain who has the overall command and responsibility. The crew is divided in to departments. Deck department is responsible for technical maintenance on deck and management of the ship, including Master Senior deck officers, Junior deck officers. Petty deck officers and deck ratings. Similar to that is Engine department who is responsible for ships machinery and automatics. Like the deck, there's Chief engineer, Senior engine officers, junior engine officer, petty engine officers and engine ratings. After technical crew comes so called hospitality crew. That consist of Hotel department, Restaurant department, housekeeping department and entertainment department. Crew matrix is shown on the next figures.

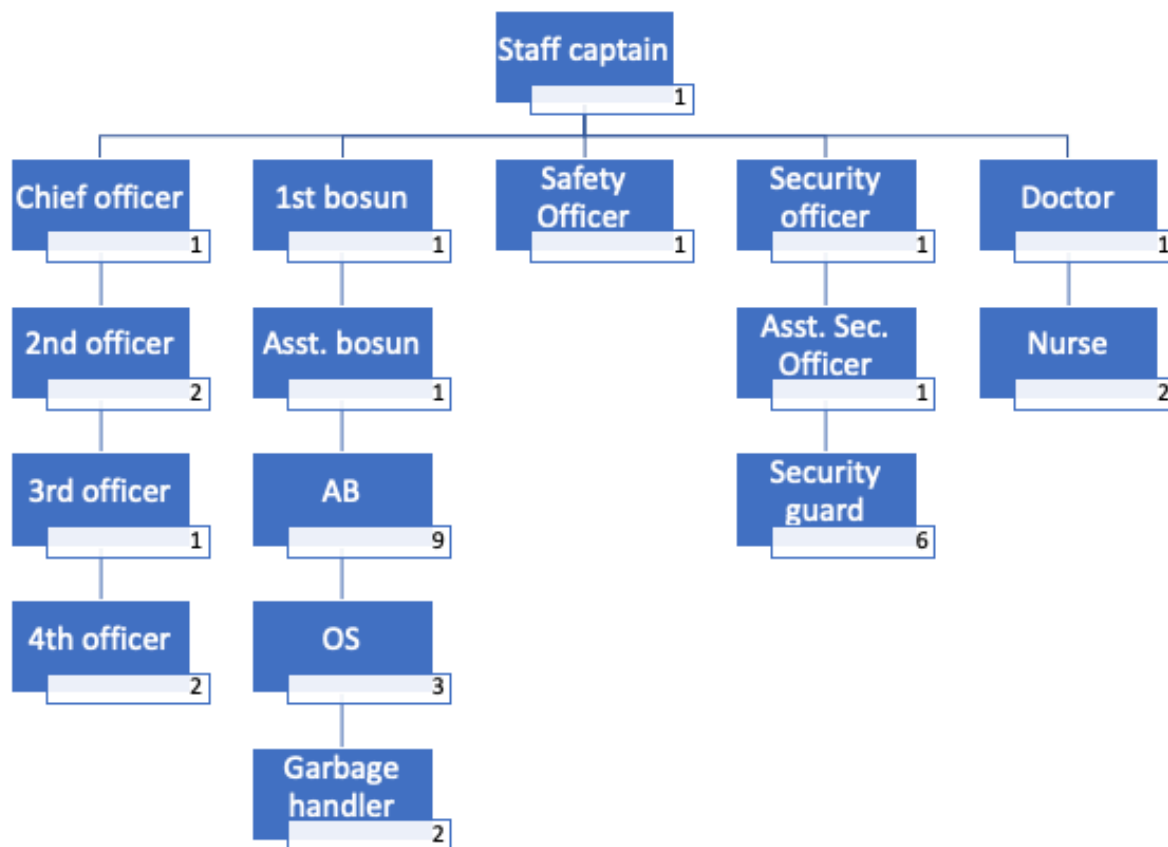


Figure 3 Deck department hierarchy(Author, Crew matrix)

The deck department, that is pointed out on Figure 3, is mainly running the ship from the bridge and on deck. It is relatively easy to implement safety for them, because they usually have good knowledge about the safety procedures. Shipping is an universal thing, where codes, and laws regulate it. So the courses and trainings are in a fixed framework.

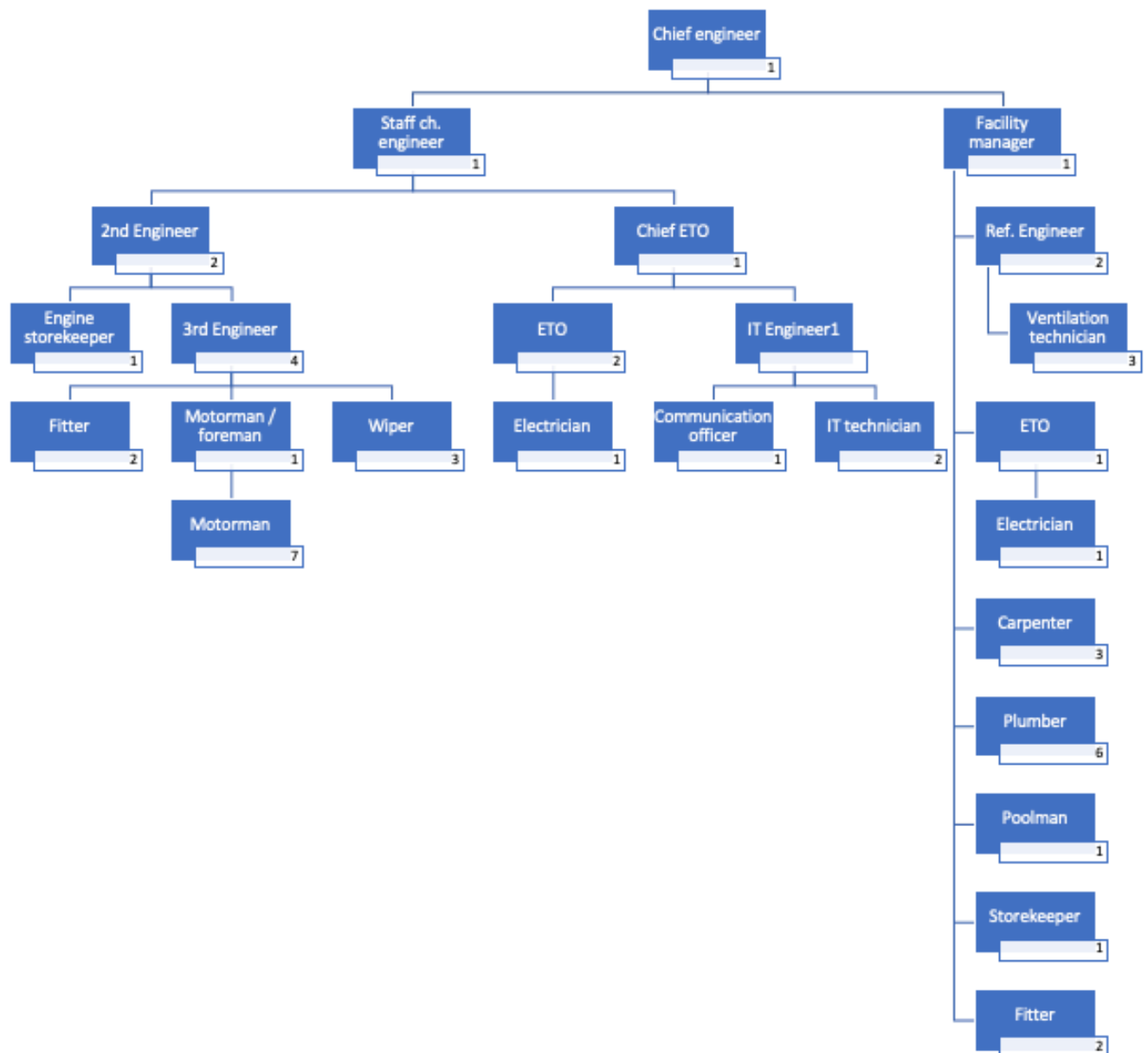


Figure 4 Engine department(Author, Crew matrix)

Second most important department onboard would be the engine department(Figure 4), without engines the ship would not sail. Similar to deck, they usually know the procedures and are adequately trained.

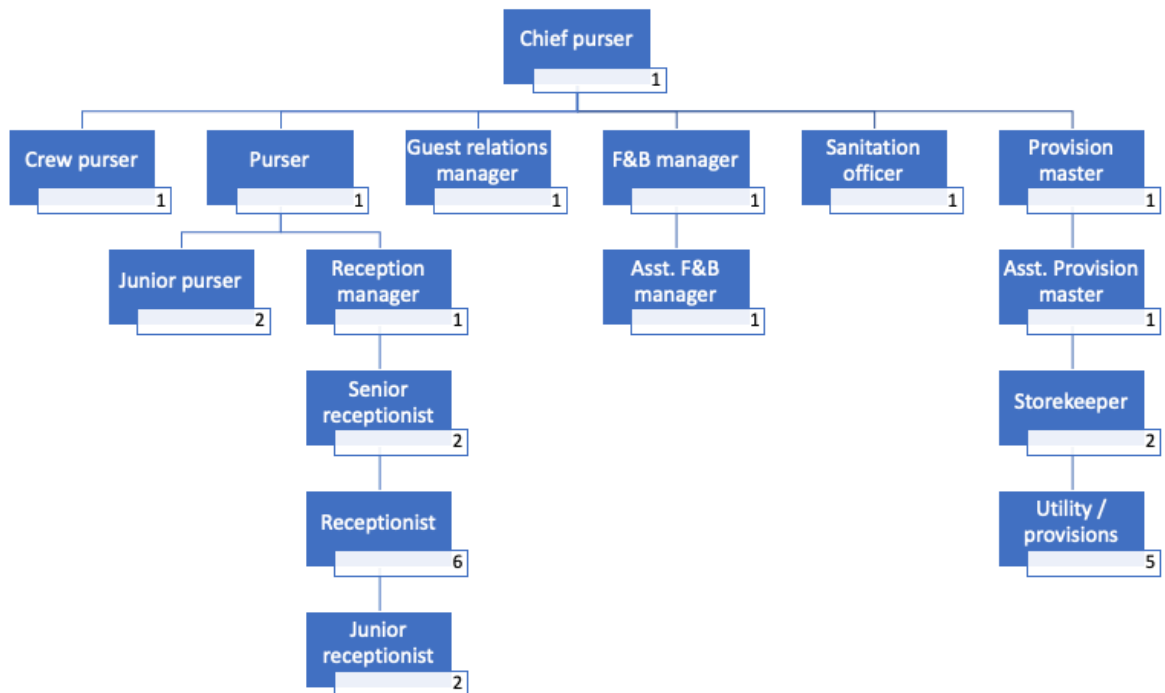


Figure 5 Hotel department(Author, Crew matrix)

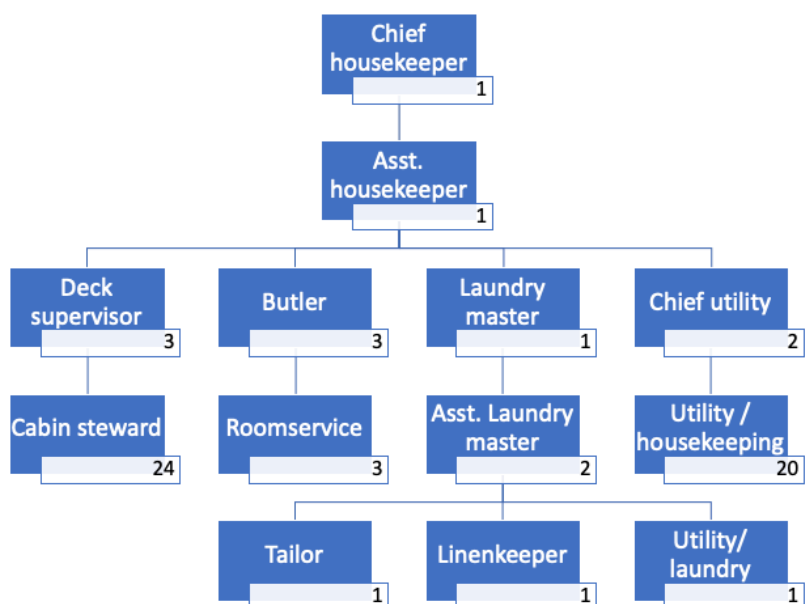


Figure 6 Housekeeping department(Author, crew matrix)

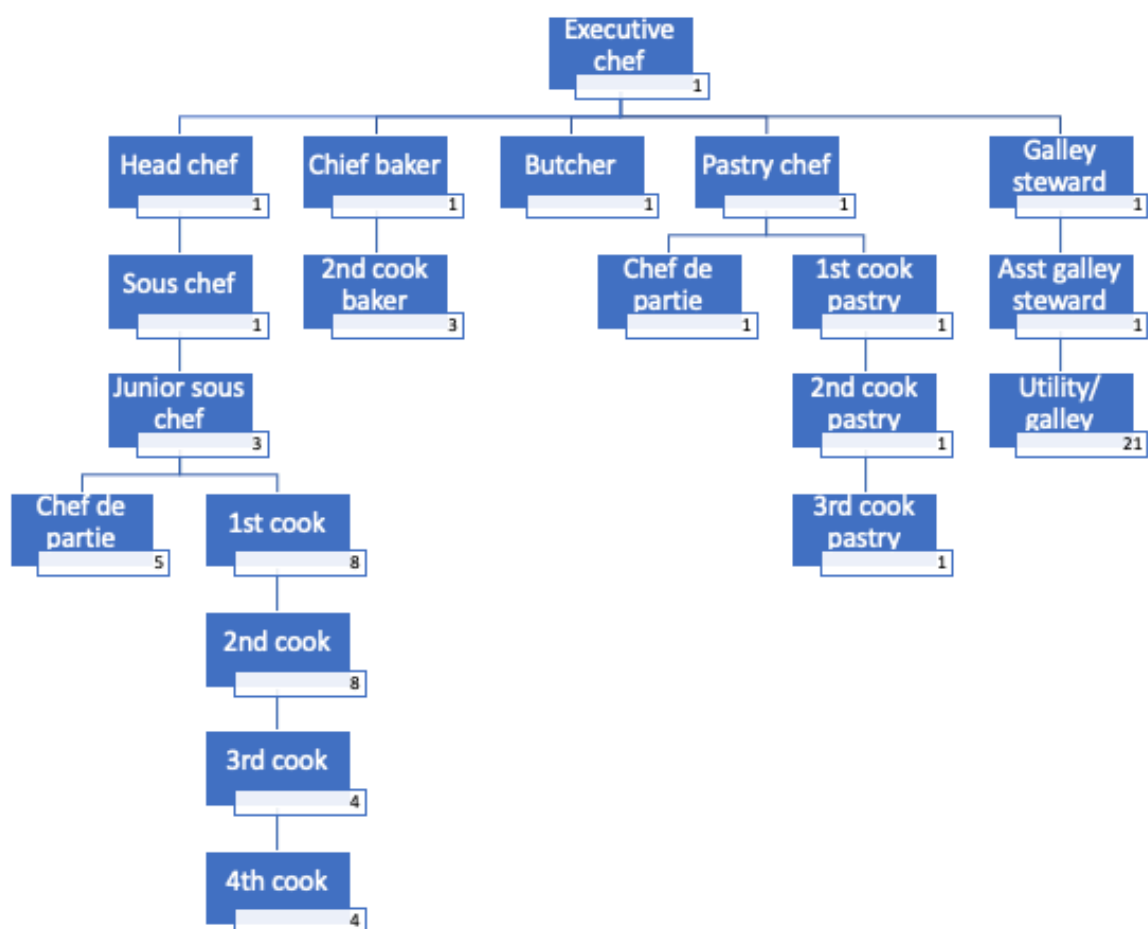
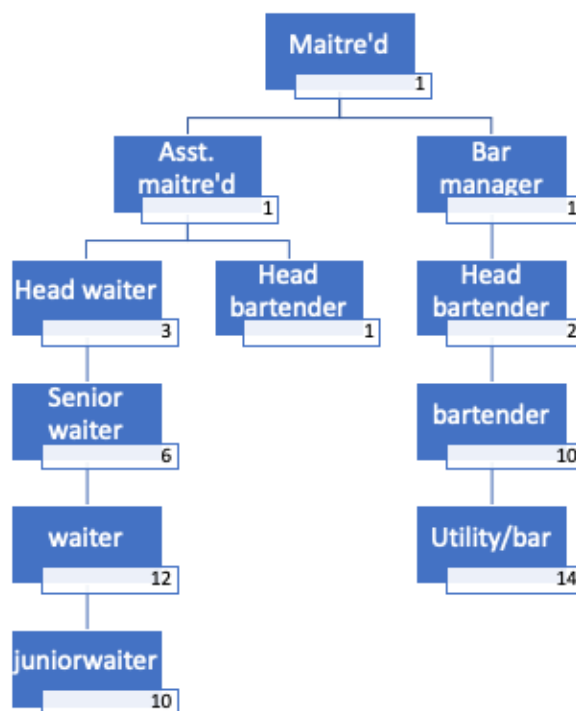


Figure 7 Galley department(Author, crew matrix)



**Figure 8 Restaurant department(Author, Crew matrix)**

There might be several crew members filling the same rank for example there might be many Bartenders or Cooks. MV Astoria Grande's full crew is 358 persons with the captain who is the overall commander. All previously shown hierarchy leaders report to the captain.

These exact positions were given by the Bernard Schulte ship management who works together with a company called Sea Chefs. They made a plan according to the owners needs and ship specifics. When the contract between ship owner and Bernard Schulte ship management was signed, then Author had a video meeting participated by captain, the author and representatives of Bernard Schulte ship management. This happened shortly after boarding the ship, so It was very motivating to study the ship and to get familiarized with every aspect regarding ship safety systems and manning needed for this. Meetings topic was about the ranks of the crew and the size of the crew which is limited by the crew cabins and total capacity of persons allowed onboard. Meeting started with discussion of the nature of the cruises and that was the foundation of future discussions. The author together with the captain had a big role in these discussions, because they were onboard and fully familiar with the ship capacities and needs. It is very important to have

some planning done before onboard because the office has their own image in the heads and occasionally don't have the relevant information about the ship. This is a business so the shipowner would like as few persons on board as possible and the ship's manager would like as many people on their payroll as possible. This leaves the ship's leaders in the middle who have to do the lobbying to get as many people onboard as needed for the safe management of the ship.

### **3 Safety officer job description**

The purpose of the role mentioned is onboard safety, safety training of crew and maintenance of all safety related equipment. The tasks and activities are allocated into 4 groups by time consumption.

*About 40% of time goes into managing the ship's emergency plan which includes ensuring all crew are assigned emergency duties on the Muster list according to the company procedures. The safety officer shall maintain close relations with all department and division heads on safety matters and practically assign work to them. He has to make sure that these jobs are documented and reported. He has primary responsibility of handling risk assessments, accident investigations and other duties related to SHE-Q system. (Job Descriptions onboard Astoria Grande, 2021)*

*About 30% of time goes into training. He has to be in close co-operation with onboard department heads cause Safety Officer is responsible for the ship's Drill and Training program. He has to make realistic trainings and has to keep the training culture continuously improving. He has to plan, schedule, conduct and report drills and trainings using the company tracking system according to SOLAS, STCW and company policies. He supervises the Safety AB and at all times monitors the satisfactory level of the crew in the matters of firefighting, lifesaving and occupational safety. (Job Descriptions onboard Astoria Grande, 2021)*

*20% of time goes into maintenance. He has to have total awareness of the ships safety equipment's condition, because he is responsible of that. He has to coach the watchkeeping deck officer and ratings in equipment maintenance and has to be*

*sure that everything is documented and reported. (Job Descriptions onboard Astoria Grande, 2021)*

*10% of time goes into general jobs. He usually is not assigned in a bridge watch rotation but he is a deck officer so he might be required to watch by the captain. The Safety officer must be familiar with the company safety management system and the relevant class and international rules applicable to the vessel. He is the Staff captain's deputy and should be at times on a strive to be familiar with his responsibilities. (Job Descriptions onboard Astoria Grande, 2021)*

The safety officer is the deputy to the Staff captain and the Staff captain is the deputy to master and is 2<sup>nd</sup> in command. He monitors and coaches navigation officers, safety officer and organizes bosun and the deck crew's work. He's responsible for stability, voyage planning, bridge management, security management, garbage management and damage control response. He has to be fully familiar with the ship's emergency plan, muster list and the safety management system. He is responsible for ship's hull maintenance. He has to plan and coordinate exterior maintenance (e.g. Painting). He has to assist in bridge duties required by captain and he has to be aware of quest activities and frequently visit guest areas in the daily operation of the vessel. He has to attend guest welcome, farewell and other guest parties as time allows.

## **4 Familiarization**

Every crew member joining a ship must go through training process, depending on the position. *Basic safety training is mandatory for everybody. They shall be competent to survive in the sea after abandoning the ship. They shall know how to minimize the risk of fire onboard and how to handle fire. They shall know how to deal with emergency situations and how to give first aid on medical emergencies. They shall know how to comply with emergency procedures for example during grounding or collision. They must know how to take preventative measures for environmental protection. As well as good safety standards with good communication. Before being assigned to shipboard duties crewmembers must be familiarized with all the necessary communication practices, safety symbols and alarms onboard this specific ship. They know how to read muster list and how to interpret it. They shall know what are the first things to do when they see a person*



*falling overboard, detect a fire or how to act when a general emergency alarm is sounded. They shall know how to don lifejackets and use basic lifesaving appliances.* (International Maritime Organization, 1978)

The ship had issued a muster list for minimum safe manning, and this was made by previous captain. 2<sup>nd</sup> officer familiarized the author with the ship and also the ongoing paperwork on board. As mentioned, the ship was in preparation for cruises and passenger handling, so this mustering system was no longer sufficient. It took author 4 days to get familiarized with the vessel and all relevant procedures.

First impressions were motivating for the author, because he likes to organize new systems and implement them. With the knowledge he had from previous companies he had a vision of the new system.

After initial familiarization author started to familiarize himself more in details. He Started with the lifesaving appliances. Went through all the 10 lifeboats that were onboard and together with bosun lowered them to the boat deck and checked all equipment. After the boats he went through the 4 life raft stations to examine them visually and to go through the lowering process. Together with equipment check he had all the documents in hand to make sure about different expiration dates on equipment. For example, the hydrostatic release units of the life rafts, water and food supply in the boats, certificates of the boat David wires and lights of lifejackets etc.

All certificates and tables were stored the safety officer's computer for overall information. It helps to keep track of the expiration dates and safety checks. The system is divided into two section FF and LSA. FF meaning Firefighting equipment and LSA stands for lifesaving appliances.

After lifesaving appliances, the author started to study the firefighting equipment. There are fixed and portable firefighting equipment onboard. Fixed systems contain the sprinklers, water hoses and CO2 system. There was a sprinkler system test in the drydock and the results came back when the author had been onboard for 2 weeks. There were issues with the water in the system. It came out that the water contains too much suspended solids and too much organic carbons. This means that the system needs to be flushed with fresh water, so it was a good lesson to study the ship's systems. Besides that, all the fixed firefighting equipment was in good and operational condition. Portable firefighting systems and lockers were all in

very good condition, the ship has 3 main fire lockers for firefighting groups and 3 extra for different occasions. The main fire lockers contain full equipment for 18 smoke divers with SCBA's – All in very good condition.

## **5 Muster list and emergency response plan**

The muster list is the backbone of onboard safety system. *All members of the crew have assigned duties regarding their position and situation. Muster list has to specify the general emergency alarm and what kind of alarms are used for indication of different alarm states. There has to be sound and verbal signals for fire on board, for evacuation, for ship damage, for security incident and for pollution. The muster list has to specify how and by who the abandon ship order will be given. All the mentioned alarms have been explained in detail in the emergency response plan, indicating who and in what force the crew has to act. The muster list must indicate the procedures for rescuing passengers from rooms and who is to close watertight door, fire doors, ready and launch the life-saving appliances, use radio equipment, close the valves, scuppers or any other opening on the ship. (International Maritime Organization, 1974)*

The author created a new muster list for full crew of 358. The new muster list contains information from the previous one, but with modifications. Technical side remained basically the same, only with small adjustments. The author changed some of the sound and verbal signals to simplify the process and make it easier to comprehend. For example, previous muster list had different sound signals for almost every situation, but new version has only 3 signals given by the ships bells and whistles as seen on Figure 9. General emergency alarm remained the same. Fire, damage alarm and evacuation alarm have all the same sound signal but with different verbal announcements following.

EMERGENCY ALARM	Emergency signal	SOUNDSIGNALS	PASSWORDS
FIRST STAGE RESPONSE			Through P.A system - First stage response, (location)
GENERAL EMERGENCY ALARM	(7 short and 1 prolonged blast)	..... █	Through P.A system - General alarm, General alarm.
SURVIVAL CRAFT MUSTER			Everybody, except the containment team has to move to their survival craft.
ABANDONING SHIP			Captain's order "ABANDON THE SHIP" through P.A.system or through vessels officers.
FIRE / DAMAGE CONTROL ALARM	( 1 prolonged blast )	█	In case of fire or damage control - "CREW ALERT, RED GENERAL"
EVACUATION ALARM	( 1 prolonged blast )	█	CREW ALERT GREEN 1, 2, 3, 4 or CREW ALERT GREEN GENERAL
SECURITY ALARM			TEST ANNOUNCEMENT 9000
M.O.B. ALARM	(3 blasts each 4-6 seconds)	█ █ █	MAN OVER BOARD(PORT SIDE OR STARBOARD SIDE)
HELICOPTER ALARM			action HELICOPTER OPERATION
POLLUTION ALARM			action SOPEP
RESCUE FROM ENCLOSED SPACE			action RESCUE TEAMS

Figure 9 Emergency signals onboard(Author, Muster list)

The muster list contains all the information required by the SOLAS convention. As seen on Figure 10 - indicating crew members rank, emergency number, substitute, lifesaving appliance and duties regarding different situations. It is easy to comprehend and explanation of the abbreviations is on the bottom part of the muster list, stating the team's responsibilities and assembly stations.

No.	Rank	Alarm number	PM To fill as a substitute	Cont. team	LIFE SAVING APPLIANCE	FIRST STAGE RESPONSE	GENERAL EMERGENCY ALARM
							..... █
1	CAPTAIN	x 001	002	x	LIFE RAFT STATION Z	BRIDGE	COMMAND CONTROL
2	STAFF CAPTAIN	x 002	001	x	LIFE RAFT STATION Z	BRIDGE	COMMAND CONTROL
<b>DECK</b>							
3	SAFETY OFFICER	x 003	004	x	LIFE RAFT STATION Z	OSC	ON SCENE COMMANDER
4	CHIEF OFFICER	x 005	006		BOAT 8 LEADER	BRIDGE	COMMAND CONTROL
5	2ND OFFICER LSA	x 004	003	x	LIFE RAFT STATION Z	BRIDGE	
6	2ND OFFICER FFE	x 008	009		BOAT 1 LEADER	FFG1	FFG1 LEADER
7	3RD OFFICER	x 006	005	x	LIFE RAFT STATION Z	BRIDGE	BRIDGE TEAM
8	4TH OFFICER	x 009	008		BOAT 2 LEADER	BRIDGE	FFG 1 LEADER DEPUTY
9	SECURITY OFFICER	x 011	050		LIFE RAFT STATION Z	SECURITY	SECURITY TEAM LEADER
10	BOSUN	x 012	013	x	LIFE RAFT STATION Z		P/S BOAT LEADER
11	2ND BOSUN	x 013	012		LIFE RAFT STATION A		S/S BOAT LEADER
12	AB	x 016	021		LIFE RAFT STATION Z	BRIDGE	BRIDGE TEAM
13	AB	x 017	018		BOAT 5 LEADER	FFG1	FFG1
14	AB	x 018	017		BOAT 3 LEADER	FFG1	FFG1
15	AB	x 019	027		BOAT 4 LEADER	FFG1	FFG1

Figure 10 Ranks onboard(Author, Muster list)

**MEANING OF THE ABBREVIATIONS.**

<u>S/S BOAT-</u>	<u>Starboard side survival craft preparation group</u>
<u>P/S BOAT-</u>	<u>Port side survival craft preparation group</u>
<u>AS A -</u>	<u>ASSEMBLY STATION A</u>
<u>AS B -</u>	<u>ASSEMBLY STATION B</u>
<u>AS C -</u>	<u>ASSEMBLY STATION C</u>
<u>AS E -</u>	<u>ASSEMBLY STATION E</u>
<u>AS F -</u>	<u>ASSEMBLY STATION F</u>
<u>AS U -</u>	<u>ASSEMBLY STATION U</u>
<u>AS V -</u>	<u>ASSEMBLY STATION V</u>
<u>AS W -</u>	<u>ASSEMBLY STATION W</u>
<u>AS Y -</u>	<u>ASSEMBLY STATION Y</u>
<u>AS Z-</u>	<u>ASSEMBLY STATION Z</u>
<u>EVAC 1 -</u>	<u>Evacuation group 1</u>
<u>EVAC 2 -</u>	<u>Evacuation group 2</u>
<u>EVAC 3 -</u>	<u>Evacuation group 3</u>
<u>EVAC 4 -</u>	<u>Evacuation group 4</u>
<u>FFG1-</u>	<u>DECK INCIDENT TEAM</u>
<u>FFG2-</u>	<u>ENGINE INCIDENT TEAM</u>
<u>FFG3-</u>	<u>INCIDENT SUPPORT TEAM</u>
<u>SECURITY-</u>	<u>security / first aid group</u>
<u>CONT. TEAM</u>	<u>containment team</u>
<u>MEDICAL-</u>	<u>first aid group</u>
<u>TECHNICAL CONTROL-</u>	<u>engine group</u>
<u>SAFETY STATION TEAM-</u>	<u>Safety station group</u>
<u>BA-</u>	<u>Breathing apparatus filling team</u>
<u>RECEPTION-</u>	<u>Reception group</u>
<u>Security alarm-</u>	<u>All crew</u>
<u>HELICOPTER-</u>	<u>Helicopter deck's preparation group</u>
<u>MOB-</u>	<u>Man Over Board group</u>

**Figure 11 Meaning of abbreviations(Author, Muster list)**

The ship personnel are divided into teams(Figure 11) and their team work enables to e.g. abandon the ship without casualties and in safe time or response to fire with adequate forces. All teams have detailed instructions of the system in the Emergency Response Plan.

The Emergency response plan consists of 16 chapters for detailed instructions for every crew member on board. Every crew member has assigned emergency number unique for him/her. Depending on the number, there are different duties related to muster list. When the crew member finds his/her emergency team name on the muster list, he or she has to look up the team from the ERP. There can be found who they have to report and what are their exact duties in the team.

Creating of the full muster list took the author about 3 weeks. After completion he presented it to the Captain and the Staff Captain for approval. All the situations were discussed and played through in their heads. Captain was pleased with the system and it was sent forward to the ship management office. Author received minor instructions about the titles of the emergency groups. After correcting it was ready for real life testing.

## 6 Emergency teams and emergency support teams

After completing the muster list and the emergency response plan, the emergency teams need to be filled with members. Depending on the team different members with different certificates of competency is required. Following is an introduction to a team and how the Author started with implementing the system. The hierarchy is shown on Figure 12.

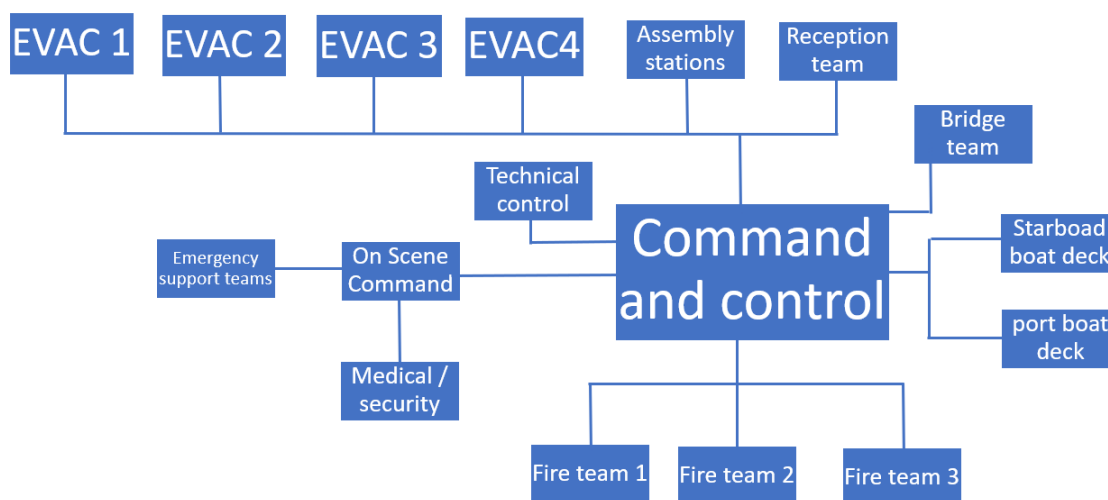


Figure 12 Emergency team's organization chart (created by the Author, ERP)

## 6.1 Command and Control

Mustering on the bridge. Often referred as control station – the team is in charge of the entire emergency response. Teams responsibility is to coordinate the emergency teams through the on scene commander. Team has to guide the medical team, security team and survival craft preparation teams according to situation. Evacuation is controlled by one member of the team. The team has to have overview of the situation so they can isolate the affected areas e.g. electrical power, ventilation, watertight and fire doors. The order to release the fixed CO2 firefighting system is given only by the master from control station. Control station contains the bridge team, who is responsible for safe navigation and external radio communication during emergencies.



**Figure 13 Safety station on the bridge of MV Astoria Grande (Alo Kask, 2022)**

On the previous figure we can see the assembly spot on the bridge for Command and Control team. It consists of the key figures on board and it is very important that they have all the relevant information. Best way to keep everything on track is to

create checklists for everybody, this helps with decisions during stressed times. The author started implementing from the Command and control team. First the author assembled the members of this team to the bridge and explained the new muster list verbally, introduced everyone new emergency numbers and different alarms. The author gave all the members copies of the muster list and shared the newly created emergency response plan. The following day similar meeting was held again. The team started playing through different scenarios and proper communication. The Author was in the other emergency groups role with walkie-talkie to simulate the communication.



Figure 14 Safety station on the bridge of MV Astoria Grande (Alo Kask, 2022)

## 6.2 Technical control

Mustering in the engine control room. Technical control is responsible for maintaining availability of safety systems in an emergency state. They have to maintain propulsion, steering and sources of power. The team has sub-teams, these teams are emergency generator team, CO2 team and safety station team.



**Figure 15 Astoria Grande Engine Control room(Author, 2022)**

After the meetings with Command and Control, the Author held a meeting with the Technical control team. They discussed peoples backgrounds and experience on passenger ships. Most of the engine crew was from different types of ship, but on the technical side it does not play a huge role, because they are hidden from the passengers. After that was a discussion about the ship's specifics e.g. where shall crew members take positions when there are different emergencies, how shall the communication work and what information they need during times of emergency. After that was sorted out, it was time for training. Again, they played through different scenarios to replicate real life situations. The Technical control team is in the middle of sub-technical teams and the Command and control Hence the communication is the biggest issue.





Figure 16 Astoria Grande Engine Control Room (Author, 2022)

### 6.3 Assessment team

Musters and equips with plans and safety gear in Assessment team locker, on deck 3. The Assessment team is responsible for the evaluation of the situation and for advising command and control about further measures to be taken. If the incident occurs in a machinery space, they assemble in the Engine control room for initial completeness check. The Author was the leader of the assessment team as an on-scene commander. The team is responsible for initial evacuation of affected areas, isolation of affected areas e.g. electrical power and ventilation. The team has to establish safe staging area for the fire teams. They are in direct contact with the command and control team advising them and vice versa. On arrival of the fire teams, the assessment team leader coordinates the fire fighting and boundary cooling at spot.



**Figure 17** Assesment team's locker (Alo Kask, 2022)

Similar to the previous teams, the Author gathered the members for a meeting. They looked and familiarized themselves with the equipment that consisted of radios, ships plans, breathing apparatuses, stretcher, axes, crowbars, helmets and other personal protective equipment. The author explained the roles of the team members and stressed the need for speed and good communication. Here started the author feel the biggest issue of implementing – the language barrier. The crew consisted of several nationalities, but the official working language was English, so there

started difficulties with the proper phrases used in radio and receiving information from other parties.



Figure 18 Assesment team's safety equipment (Alo Kask, 2022)

#### 6.4 Safety station team

Mustering at the safety station, on deck 3. The team is responsible of handling the ships systems e.g. ventilation, dampers, electrical systems and the release of the CO2 systems. The team usually consists of engineers and motormen who are responsible for theses system in day to day job. The team reports their mustering to

technical control who relays the message to command and control. Assessment team leader is in close contact with the team, regarding the systems. Handling of these specific technical groups was the hardest for the author, because the ship systems are very complicated and specific, so it is very hard to assess the outcome of the situations created for training. The author has general knowledge of these systems, but how and where are and how should a crewmember turn different buttons or valves is a bigger question. To manage all this information the author had close discussions with 2<sup>nd</sup> Engineer on board about the systems and how should different procedures be in checklists. This part was very interesting, especially learning the CO<sub>2</sub> system launch by heart.



**Figure 19 Safety station (Alo Kask, 2022)**

The CO2 system is especially sensitive because it is very dangerous for humans. It is very important to have proper communication and leadership during the release of CO2, that all the crewmembers will report and be counted after leaving their workstation. It is important to have logs stating any so called visitor in the area. The system fills the atmosphere in specific rooms with CO2 therefore removing one of the building blocks of fire – O2 causing the fire to die.



Figure 20 Safety station CO2 system release (Alo Kask, 2022)

It is very important, that during fires affecting the engine room or other machinery, the fuel supply would be turned off instantly, reducing the possibilities for explosions or further combustion.



Figure 21 Safety station fuel valve emergency closing unit (Alo Kask, 2022)

## 6.5 Firefighting groups

The ship has 3 main fire fighting groups, they assemble in different fire lockers according to the muster list. The teams are divided to Deck fire group, Engine fire group and boundary cooling fire group. The team has to muster according to the muster list and the leader has to report to the command and control. When the team members are dressed and equipped, they report to the on-scene commander for further orders. Typically, they are ordered to go to the safe staging area which is set by the on-scene coordinator. The fire groups have all relevant equipment for smoke diving and breathing in contaminated areas, including SCBA, fireman outfits, axes, hoses and heat cameras. Some of the team members are assigned into closing team, meaning that their responsibility is to close the fire damper which are not closed automatically. They have a location list for manual closing



Figure 22 Fire equipment (Alo Kask, 2022)



**Figure 23 Fire locker equipment (Alo Kask, 2022)**

Shortly after completing the muster list and assigning the emergency numbers a meeting was held with the fire groups. The author felt that these are the most important teams to teach, because it is very important that the crew reacts fast for incidents regarding fire. Fire onboard is one of the most dangerous thing that can happen and depending on the situation it can spread rapidly causing the ship to be abandoned. So the author spent most of the time training fire groups. It started with role assignments, first of all the fire group leaders. They have to communicate with the on-scene commander and command their group at the same time. After introducing the leaders to the group we started working together with the team. Every member had do choose their costume and place in the locker. According to the author's previous experience during the port state controls, it is one of the main topic that is examined during routine controls. And it is better to be prepared and organized. After every member chose their size outfits and got familiar with the



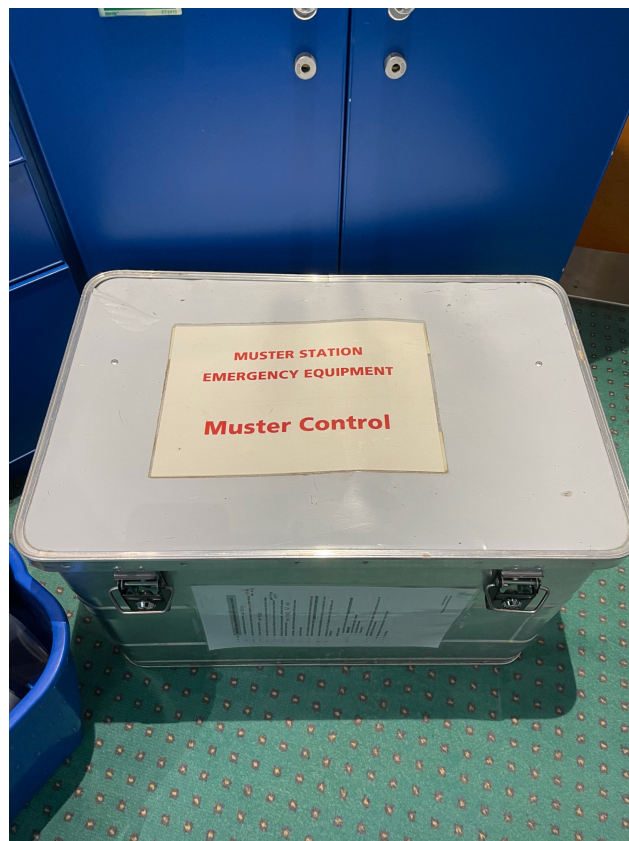
equipment we made a test. We locked the fire locker, set up a stopwatch and gave a start. We measured time from unlocking the fire locker until every member was fully dressed, equipped and ready for action. First times were failures, because everybody wanted to go in the locker at the same time and because the locker is limited by room, it caused congestion. Authors recommendation was that after unlocking, crewmembers go in one by one to take their costume and then head out to the hallway, while everybody is dressing in the hallway the leaders deputy can prepare SCBA for donning, so whoever is ready with the outfit can go to the door and get his/hers SCBA. This makes everything smoother and gives a better overview about the dressing process. After fully dressed, the leaders deputy hands over last pieces of equipment like additional fire hose, axes, additional air cylinder and finally reports to the leader that team is ready for action. Then takes his equipment bag that contains ship drawings and whiteboard to write the log of times and air pressures to monitor air consumption by the smoke divers.



**Figure 24 Fire locker equipment (Alo Kask, 2022)**

## 6.6 Evacuation teams

There are 4 EVAC teams on the ship. Each of them assemble in a different location, according to their evacuation area. The team usually consist of catering and hotel crew, who work in these areas every day. Teams responsibility is to evacuate everybody from non-technical rooms and guide the passengers to the assembly stations and to block any people from entering the evacuated areas. They report to the control station. Control station has one member who is managing the evacuation. Evacuation teams have to get equipment from reception. That includes identification vests, hats, flashlights, ships plans, keys, cabin cards, loudspeakers, and radios.



**Figure 25** EVAC team equipment chest (Alo Kask, 2022)

It was very challenging to get the evacuation running as smooth as possible. Again many members of the crew had not been on a passenger ship before and on the other hand, other who were, they knew a different kind of evacuation process. The Author made it very simple, He divided the ship into 4 parts. Each part got a EVAC name. Starting from EVAC 1 to EVAC 4. All teams had their own area to evacuate and finally all teams finished on deck 6 where the muster stations were located.

Every member in each team got their number specific area to evacuate or to block or guide the movement in the staircases. Since there was not a full crew onboard, the Author organized all evacuation team members to one team, starting from EVAC 1. They played through the evacuation of this area together with mustering and communication with the muster control team, when this was adequate they moved to EVAC 2 team and started all over. This teaches everybody different scenarios and was very life like. During these training the Author hid papers all around the search areas with a word passenger on it and the papers were numbered, so if not found they knew which area was not properly searched or if there were other problems. After one month of training every week, the evacuation process was smooth and communication very good.



Figure 26 EVAC team's equipment (Alo Kask. 2022)

## 6.7 Medical team

Medical team musters in the ship's hospital on deck 3. Teams main duty is to provide medical support if needed. After mustering the teams leader has to report to the control station. When receiving orders from control station they have to recover casualties and provide medical care to them. If there is any passenger with mobility

impairment or passenger who is under medical treatment in his/her cabin, then the medical team is responsible of checking them and keeping them under treatment.



**Figure 27 Medical Team's Grab Bags (Author, 2022)**

During Medical Team training the Author had his sole trust on the doctor onboard. He was a surgeon with greater knowledge about hospitals and medical equipment than the author. They worked together from the beginning. First they assessed the situation in the hospital. They went through all the equipment and drugs to see if there were any of it expired, at the same time they updated the logs and tables regarding that so in the future it would be easier to comprehend. After all checked out, they organized the first response equipment ready for emergencies(Figure 27). The equipment was in very good order and very well prepared. After that they had meetings about the equipment and how to use them, including the use of a stretcher(Figure 28). During these meetings the Author thought that all crew members should be familiar with this and arranged a full crew meeting in the ships

Theatre. During this meeting the Author explained the need for fast responding during medical incident, because in some situations CPR or Heimlich manoeuvre could save people from a certain death. After that the ships doctor demonstrated the manoeuvres and explained them in detail. The author received a positive feedback from the crew because they really learned something and thought that they are more confident now during emergencies.



**Figure 28 Medical Team's Stretcher (Author, 2022)**

## 7 Conclusion

Every month the safety officer creates a drill plan for the crew. This consists of mandatory drills that are required by the ship management, flag state and codes that are in force. These include but is not limited to General emergency drills, pollution drills, emergency steering trainings, different fire scenarios, collisions and emergency towing drills. Each crew member is obligated to participate in drills according to assigned emergency number. All crew members who have special duties for example life boat leaders or fire group leader etc. has to have proper certification according to STCW code. The most consuming part of creating the muster list was to create a exact overview of the ship's safety equipment and lifesaving appliances and how many people is needed to safely operate these pieces of equipment. After all this was done, then it was time to choose the key figures. Some of the key figures are self-evident, for example captain has the general command without a doubt, or the chief engineer is responsible of the machinery related teams. The key figures should fit in the chain of command that is in force when the ship is in regular mode. Of course there can be exemptions, for example lifeboat leader can be anyone who has a certificate for it, but it is good seamanship to fill this position with somebody who has more experience. It is fairly easy with technical crew, because most of the equipment is universal and usually traditional. But when it comes to evacuation and dealing with passengers, it is more complicated. I supported heavily on my previous experience. Regarding that, I still used the chain of command – meaning the head of the evacuation will be the head of hotel department, who has a substitute as chief purser. They are most familiar with the layout of the ship and leaders in the day to day operations anyway. When I divided the ship into evacuation zones, then I assessed who should work in the zones on a regular base. For example, when the zone is mainly galley area, then the zone leader would be the executive chef, and the team would mainly consist of people who work in this area. Same with the evacuation zone, which consists of restaurants and bars. It would be leaded by restaurant manager together with the bar manager and other ranks are filled by the people who work there. After the positions were filled with enough people, then all the other can be used as a non-specific duty team. This gives flexibility in the size of the crew and if needed gives extra hand to complete a task.

Big part of the crew onboard MV Astoria Grande was with cargo ship background or did not have any sea experience at all. That created a bigger challenge for the safety officer, because the crew had to meet the standard for evacuating a big number of passengers while safely handling the emergency situations. It is much easier to implement safety on a cargo ship where the crew is about 30 persons and there are no passengers.

The author held previously mentioned meetings with all emergency teams to familiarize members with their responsibilities and to assign all members specific tasks. This was all done to prepare everybody for general emergency drill, where all the teams must work together to safely eliminate danger or abandon the ship if needed. It is very important that the communication is flowing and the captain has good overview of the situation.

After a week of meetings and training the ship held a general emergency drill. The author created a situation that fire safety AB fills one cabin with smoke and leaves a lifejacket light in the cabin to indicate fire. The smoke would trigger fire alarm on the bridge and the OOW has to react. The Officer on bridge sends somebody to check the area and give feedback. Immediately after confirmation of fire the fire alarm is sounded all over the ship. This was the beginning of the drill. All relevant teams had to muster and start reporting. As mentioned, the fire teams and technical teams consist of deck and engine crew, so it was fairly good reaction. Ships electrician turned off the electricity in the affected area and shut the ventilation. The safe staging area was organized by the assessment team and communication was established with the bridge team. Finally after first team reported readiness in the safe staging area, they started smoke diving (Figure 29). Second team, after arrival was sent to boundary cooling and the closing team was sent to close the fire flaps. The situation was created as impossible to manage so the fire would get out of hand. That caused the other teams to muster to start the evacuation and preparing the lifesaving appliances. Finally everybody were mustered at their survival craft and body count was made. It was surprising that everything worked that smooth and everybody knew their emergency number by heart and where to report. Of course it was the first general drill with many shortcomings, but overall picture was very good and promising. The author felt like he completed the task and later during a debriefing with other officers the shortcomings were discussed in a open

atmosphere. All leaders had some recommendations about the communication, mustering and even the donning of the firefighting equipment procedures. Everything was discussed and all questions found answers.



**Figure 29 Fire team in action(Author, 2022)**

The safety onboard a cruise ship is brought to life through good communication and meetings, where all the procedures are discussed and explained step by step. It takes time and repetitions to implement it. The safety officer has to be a role model for that. There are situations where crew members really want to give their best but they might be under trained or they do not see the main picture. So It is important to combine different emergency teams with another to give the information needed. I saw the most optimal way to use crew as they are. I filled the emergency teams with people who work together, so they already have some communication and know each other limits, this way they can even have fun during exercises. The feedback was good about my work onboard the ship. I like to keep a friendly atmosphere were anyone can express their viewpoints or questions and it looks like it works. I have been working together with captains who like to use the authority



way that there is their opinion or the wrong opinion. This creates a toxic environment, causing the real and relevant information to be filtrated before the master gets it. It is not safe way to implement rules onboard.

## List of Figures

Figure 1 Astoria Grande Pilot card (ship management, ship documents, 2021) .....	2
Figure 2 MV Astoria Grande in drydock after change of ownership (Kennart Kose, 2021).....	5
Figure 3 Deck department hierarchy(Author, Crew matrix) .....	6
Figure 4 Engine department(Author, Crew matrix) .....	7
Figure 5 Hotel department(Author, Crew matrix).....	8
Figure 6 Housekeeping department(Author, crew matrix) .....	9
Figure 7 Galley department(Author, crew matrix).....	9
Figure 8 Restaurant department(Author, Crew matrix).....	10
Figure 9 Emergency signals onboard(Author, Muster list).....	15
Figure 10 Ranks onboard(Author, Muster list).....	15
Figure 11 Meaning of abbreviations(Author, Muster list) .....	16
Figure 12 Emergency team's organization chart (created by the Author, ERP)....	17
Figure 13 Safety station on the bridge of MV Astoria Grande (Alo Kask, 2022)....	18
Figure 14 Safety station on the bridge of MV Astoria Grande (Alo Kask, 2022)....	19
Figure 15 Astoria Grande Engine Control room(Author, 2022) .....	20
Figure 16 Astoria Grande Engine Control Room (Author, 2022) .....	21
Figure 17 Assesment team's locker (Alo Kask, 2022) .....	22
Figure 18 Assesment team's safety equipment (Alo Kask, 2022) .....	23
Figure 19 Safety station (Alo Kask, 2022) .....	24
Figure 20 Safety station CO2 system release (Alo Kask, 2022).....	25
Figure 21 Safety station fuel valve emergency closing unit (Alo Kask, 2022) .....	26
Figure 22 Fire equipment (Alo Kask, 2022) .....	27
Figure 23 Fire locker equipment (Alo Kask, 2022) .....	28
Figure 24 Fire locker equipment (Alo Kask, 2022) .....	29
Figure 25 EVAC team equipment chest (Alo Kask, 2022).....	30
Figure 26 EVAC team's equipment (Alo Kask. 2022).....	31
Figure 27 Medical Team's Grab Bags (Author, 2022) .....	32
Figure 28 Medical Team's Stretcher (Author, 2022).....	33
Figure 29 Fire team in action(Author, 2022).....	36

## List of Tables

Table 1 MV Astoria Grande Particulars(ship documents, Tschudi Ship Management).....	4
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