REPUBLIC OF CYPRUS
MARINE ACCIDENT AND INCIDENT INVESTIGATION COMMITTEE

Investigation Report No: 91E/2017

Very Serious Marine Casualty

Death of ORDINARY SEAMAN (O/S)
on M/V "DENIA CIUTAT CREATIVA"
on 18/07/2017
at Barcelona Port

MAIC
Marine Accident and Incident Investigation Committee
Cyprus

Foreword

The sole objective of the safety investigation under the Marine Accidents and Incidents Investigation Law N. 94 (I)/2012, in investigating an accident, is to determine its causes and circumstances, with the aim of improving the safety of life at sea and the avoidance of accidents in the future.

It is not the purpose to apportion blame or liability.

Under Section 17-(2) of the Law N. 94 (I)/2012 a person is required to provide witness to investigators truthfully. If the contents of this statement were subsequently submitted as evidence in court proceedings, then this would contradict the principle that a person cannot be required to give evidence against themselves.

Therefore, the Marine Accidents and Incidents Investigation Committee, makes this report available to interested parties, on the strict understanding that, it will not be used in any court proceedings anywhere in the world.

This marine accident investigation was carried out by Cyprus MAIC as Lead Investigating State and Spanish CIAIM as substantially Interested State. The accident investigation was conducted in cooperation with the Spanish CIAIM, which provided essential information and data relevant to the accident.

The investigation was conducted following the guidelines and policies of the Republic of Cyprus Law, the applicable IMO Code, IMO Circulars, EU Regulation and EU Directive.

Contents

List of Acronyms and Abbreviations

A/B	Able Seaman
BAC	Blood Alcohol Content
C/E	Chief Engineer
C/O	Chief Officer
CIAIM	Spanish Maritime Accident & Incident Investigation Standing Commission
CoC	Certificate of Competency
GA	General Alarm
CPR	Cardio-Pulmonary-Resuscitation
DPA	Designated Person Ashore
ISM Code	International Management Code for the Safe Operation of Ships
Knots	Speed in nautical miles per hour
Lat.	Latitude
Long.	Longitude
LT	Local Time
m	Meter
MC	Management Company
MT	Metric Ton
NM	Nautical Mile
O/S	Ordinary Seaman
PSN	Position
2/O	Second Officer
SMC	ISM Safety Management Certificate
SMM	Safety Management Manual
SMS	Safety Management System
SOLAS	Safety of Life At Sea Convention
STCW95	International Convention on Standards of Training, Certification and Watch keeping for Seafarers 1978, as amended
UTC	Universal Time Coordinated
VHF	Very High Frequency Radio
ZT	Zone Time

1. Summary

In conducting its investigation, the Marine Accident Investigation Committee (MAIC), reviewed events surrounding the accident, documents, external examination report of the corpse, preliminary conclusions of forensics report, final toxicological report issued by Spanish Authorities and performed analyses to determine the causal factors that contributed to the accident.

Accident Description

On 18/07/2017 about 21:20 LT, during loading operations of driverless cargo vehicles onboard MV "Denia Ciutat Creativa", flying Cyprus Flag with IMO No. 9019054, while the vessel was berthed at Barcelona port-Spain, an Ordinary Seaman (O/S) of Bulgarian nationality was run over by a middle sized truck, which was driven by stevedore driver, during the maneuvering of the said truck on the aft Upper Deck (Deck 3) port side. The truck ran over the O/S with the left side rear wheels with fatal consequences. The truck was being driven in reverse (backing-up) to the parking position (Lane 7-aft port side, position 64).

There were no eye witnesses of the accident. The shore emergency authorities attended the vessel immediately after the accident providing first aid to the O/S who, despite their efforts, passed away on 21:39 LT.

The case is under judicial investigation as per Spanish Law and Legislation.

As a result of the running over by the truck, the cause of death of O/S was the thoracic-abdominal trauma and destruction of vital organs resulting to traumatic shock (hemothorax, hemoperitoneum, liver lacerations).

Conclusions

The truck ran over the O/S with the left rear wheels. The plastic mud flap of the truck which was found to have fallen off between the front and rear wheels left side indicates that the truck ran over the O/S with the left rear wheels.

The O/S was found unconscious lying in a direction transverse to the longitudinal axis of the truck, within the yellow border lines of lane 7 with the head on the port side and the feet on starboard side, thus he was not standing at the left side of the truck within the safety port side safety line (the body should be half-in, half out). The O/S was most probably moving from right to left at the rear of the truck when was hit by the vehicle or lost consciousness.

In accordance with the final post mortem toxicology report, the deceased person was found with a blood ethanol (alcohol) content of 1.93 g/l (grams per liter).

Due to lack of eye witness of the accident and considering the large space which was available to the O/S for movement and taking into consideration the possible effects caused from his blood ethanol (alcohol) content of 1.93 g/l, the reasons for the O/S being behind the truck cannot be reliably determined. However, according to international publications, having blood ethanol content of 1.93 g/l is considered a significant amount which could impair the mental and physical condition of the affected person and may have resulted in unsafe and risky moves. In accordance with the medical toxicology publication referenced in the post mortem toxicology report, the following effects could be produced for concentration of 0.9 – 2.5 g/l (the level of impairment may vary from one person to

another and can be affected by such factors as genetics, adaptation to chronic alcohol use and synergistic effects of drugs):

- emotional instability and decreased inhibitions;
- loss of critical judgment;
- alterations of memory and comprehension;
- decreased sensory response;
- increased reaction times;
- muscular incoordination.

With due consideration of the above, there are three possibilities which may have led to O/S lying behind the truck:

1. Slippage / loss of balance (e.g. due to muscular incoordination, possible oil stains / water, tripping on lashing pots) and then run over by the truck when crossing lane 7 at the rear of the truck from right to left side.
2. Hit by the truck and then run over when crossing lane 7 at the rear of the truck (e.g. wrong positioning of the O/S caused by poor judgement, impaired depth perception, decreased sensory response, increased reaction times in combination with an abrupt increase of the truck speed due to the deck inclination).
3. Loss of consciousness and then run over by the truck due to possible effects caused from his blood ethanol content.

Irrespective of the aforementioned possible O/S actions, the stevedore driver stated that he never saw the O/S at any stage of the maneuvering and that several times he parked the trucks without the assistance of the crewmembers.

Due to the lack of eye witnesses no safe conclusions can be extracted as to the exact conditions of the accident.

On the basis of the information and data presented to the investigator and the analysis carried out, the following categories of causes were considered as the most appropriate:

Root Cause:

The O/S presented himself for duty under the influence of alcohol (blood ethanol (alcohol) content of 1.93 g/l). This led to O/S being unfit for duty.

Direct Cause:

The lack of visual contact between the stevedore driver and the O/S is the direct cause of the accident. If visual contact had been established at the beginning of the maneuver, the stevedore driver would have stopped the truck when he could not see the O/S for any reason.

Contributing Causes:

1. The impaired mental and physical condition of the deceased person resulting from a blood ethanol (alcohol) content of 1.93 g/l may have been a contributing cause to the accident.
2. With due consideration to the possible visible effects on the behavior of the deceased person, failure of the other involved crew members to detect that the mental and physical condition of the deceased person was impaired may have been a contributing cause to the accident.
3. The poor implementation of certain parts of the safety management system (e.g. lack of drug and alcohol examination prior to recruitment, failure to implement the safety guidelines and procedures, either verbal or documented regarding the procedure for loading vehicles,

implementation of the drug and alcohol procedure onboard the vessel) may have been a contributing cause to the accident.

4. The deceased person ending-up lying behind the truck during his movement due to any of the following reasons: wrong position, loss of balance, loss of consciousness, slippage (slippery surface), tripping (lashing pots), may have been a contributing cause to the accident.
5. Routine procedure from stevedore driver may have led to over self-confidence, which resulted in carrying out the operation without the need of assistance by a crew member, may have been a contributing cause to the accident.
6. The impaired rearwards visibility of the truck driver due to damaged mirror may have been a contributing cause to the accident.

Recommendations

1. For the Management Company:
   a. The Safety Management System procedure C.07/PG.012 "Alcohol and other drugs" to be revised in order to ensure that scheduled and unscheduled alcohol tests will be carried out at specified intervals for all crew members, as per the ISM Code, clause 6. (Within one month)
   b. The Safety Management System Chapter 6 "Resources and Personnel" to be revised in order to ensure that seafarers will be subject to drug and alcohol examination by medical practitioners at their home country prior to their embarkation irrespective of the number of previous contracts completed with the company. The company to ensure that crew managers and / or manning agents are made aware and implement the new requirements, as per ISM Code, clause 6. (Within one month)
   c. The company to ensure that the safety management system is effectively implemented onboard covering all sections of the ISM Code, as per ISM Code, clause 12. (Within three months)
   d. The Safety Management System to be revised in order to include procedure / working method / instructions for vehicles guidance when loaded or discharged under the ISM Code, clause 7.
   e. Appropriate signs and notifications to be posted in entrances and garage areas of the vessels, ensuring that, as a minimum, the following safety instructions must be strictly adhered to by both crewmembers and drivers (Within one month):
      - All vehicles shall always be assisted for parking by a crewmember.
      - Visual contact with the crewmember to be always maintained.
      - Stop immediately the vehicle when losing visual contact or when hearing whistle.
   f. Guidelines to be provided for training purposes to the crewmembers involved in assisting vehicles for parking indicating the safe zone for crew movement and the reverse blind sector of drivers for several types of vehicles (e.g. private cars, articulated trucks, lorries etc). Training to be provided to all personnel involved. (Within three months)
2. For the Vessel:
   a. The Master to ensure that the requirements of the safety management system are properly implemented by all crew members. (Within one month)
   b. The Master to enhance a safety culture on board encouraging crewmembers to report any unusual behavior of any crew member. (Within one month)
3. For the Stevedore Company:
   a. The vehicles drivers to ensure that whenever they do not have visual contact with the assigned parking guide, they should stop their vehicles until achieving visual contact, especially in reverse manoeuvring. (Within three months)

2. Factual Information

2.1. M.V. “DENIA CIUTAT CREATIVA”

Figure 1: M/V “Denia Ciutat Creative”

The vessel is owned and managed by “BALEARIA-EUROLINEAS MARITIMAS S.A.” since 11/04/2016. The company’s particulars are as follows:

- IMO Number: 1151878
- Address: Estacion Maritima, S/N
  03700 Denia, Alicante
  Spain

The vessel is a Ro-Ro/Pax and is built with three vehicle decks and a number of passenger cabins.

2.1.1. Ship Particulars

Name of ship:	DENIA CIUTAT CREATIVA
IMO number:	9019054
Call sign:	5BRU3
MMSI number:	210133000
Flag State:	CYPRUS
Type of ship:	RO-RO PASSENGER
Gross tonnage:	19308
Length overall:	150.42 meters
LPP:	137.39 meters
Breadth overall:	23.4 meters
Depth:	13.4 meters
Classification society:	Bureau Veritas
Registered shipowner:	BALEARIA EUROLINEAS MARITIMAS S.A.

Shipmanagement company:	BALEARIA EUROLINEAS MARITIMAS S.A.
Year of build:	1992
Deadweight:	5985 tonnes
Hull material:	Steel
Hull construction:	Single Hull
Propulsion type:	Diesel Engines
Type of bunkers:	Heavy Fuel Oil
Number of crew on ship's certificate:	Twenty Seven (27)

2.1.2. Voyage Particulars

Port of departure:	Ciudadela (Menorca)
Port of call:	Barcelona
Type of voyage:	Domestic
Cargo information:	Loaded condition (Passengers and vehicles)
Manning:	Arrived at Barcelona with 53 crew

The vessel was engaged on a daily liner trade pattern between the ports of Barcelona and Ciudadela (Menorka, Balearic Islands). The vessel transports passengers and vehicles. The vehicles are divided into two main categories; private vehicles and cargo vehicles. The cargo vehicles consist of trailers and trucks of various sizes with or without drivers. The driverless vehicles are loaded / discharged at the port of Barcelona by stevedore drivers of the State Stevedore company. The operations at the port of Barcelona start and finish between 20:30 LT and 23:00 LT approximately, depending on the arrival of the vessel at the port. Normally, upon completion of the discharging, priority is given to loading the driverless cargo vehicles, then the cargo vehicles with drivers and lastly the private vehicles.

2.1.3. Marine Casualty or Incident Information

Type of marine casualty/incident:	Very Serious Marine Casualty
Date/Time:	18/07/2017 @ 21:20 Hours LT
Location / Position (Latitude/Longitude):	Barcelona Port / (41°20'54.43"N / 2°10'0.41"E)

Figure 2: Layout of Barcelona Port showing accident location

External and Internal Environment:	Sea State: Calm Wind: ---, Day/Night: Twilight Sky: --- Visibility: Very good
Ship operation and Voyage segment:	Normal operation alongside loading / unloading
Human Factors:	Yes
Consequences:	Death: 1 crewmember (Ordinary Seaman)

The vessel on 18/07/2017 was berthed at the time of the accident at the port of Barcelona, Lepant Wharf 27A and was loading driverless cargo vehicles for Ciudadela port, following the discharge of all incoming vehicles. The vessel was engaged in liner trade pattern between the Barcelona and Ciudadela ports on a daily basis. During the loading operation of driverless cargo vehicles by stevedore drivers at 21:20 LT, the Ordinary Seaman (O/S) was run over by a truck on aft Deck 3 port side with the left rear wheels, with fatal consequences. The truck was being driven in reverse to its designated parking position (Lane 7-aft port side, position 64). Although on Deck 3 two crewmembers were additionally working at the time, Bosun and A/B, no one directly witnessed the accident (Master's statement and interviews).

2.1.4. Shore authority involvement and emergency response

- Ambulance was notified at 21:21 and attended the scene at 21:28. The attending medical personnel made efforts to resuscitate the O/S.
- Police Force was notified and attended the scene at 21:33.
- Harbour Master was notified.
- Principal Investigator of the Spanish Maritime Accident & Incident Investigation Standing Commission (CIAIM) attended the vessel on 19/07/2017 between 20:00 LT and 23:00 LT.
- Spanish Maritime Authority officials attended the vessel on 19/07/2017 between 20:00 LT and 23:00 LT. Port State Control inspection was carried out.
- Marine Accident Investigator from Cyprus MAIC attended the vessel on 27-28/07/2017 between 20:30LT and 23:00 LT at Barcelona port.

3. Narrative

3.1. Sequence of Events

1. The Stevedore driver, employee of the State stevedore company in Barcelona, during loading operations in Barcelona port on 18/07/2017, proceeded to load onboard a middle sized truck. When the driver embarked on the assigned truck on the pier, he realized that the right upper mirror ("plain rear view mirror") was broken. The mirror was a combined one, with its upper part for ordinary view, and the lower part for wide-angle view. When the driver arrived to the stern ramp/door, he reported the fact to his supervisor requesting for further instructions. His supervisor asked him if he could manage, in which question he replied positively. The driver decided to proceed considering that the view through the lower right mirror ("wide angle rear view mirror") was adequate. (From the driver's statement to CIAIM)

2. The driver received initial instructions by the vessel's Chief Officer, who was at the stern ramp/door, to drive the truck to Upper Deck (Deck 3). The vessel's Bosun, who was the recipient of the truck on Deck 3, instructed the stevedore driver to park the truck at the aftermost parking position of Lane 7 port side (vehicle position 64). No other vehicles had been parked in the vicinity.

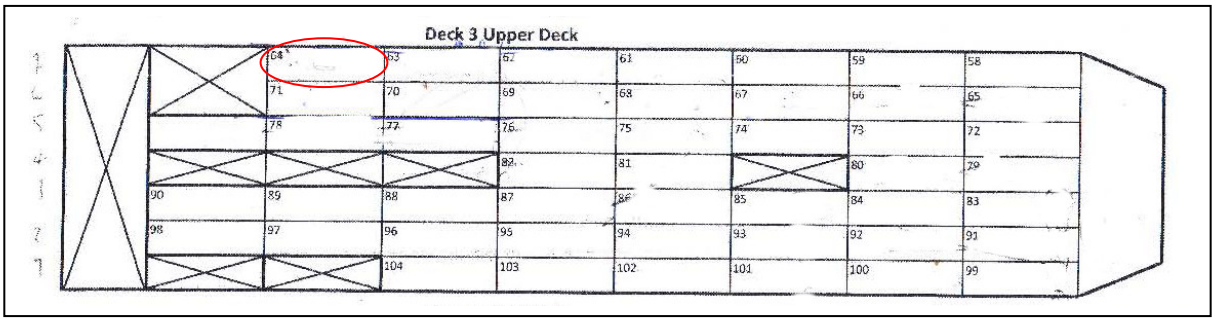

Figure 3: Designated final parking position of the truck on Upper Deck (Deck 3)

3. The Bosun was standing at the top of the internal ramp on Upper Deck (Deck 3) when he provided the instructions to the driver for the parking position of the truck. On the Upper Deck, an A/B and an O/S, were assisting the Bosun in guiding the vehicles to their parking positions. The A/B was standing at the forward area of the Upper Deck. The O/S was close to the Bosun and agreed with Bosun to guide and assist the said truck to its final parking position.

4. The driver of the truck proceeded well forward to the Upper deck port side in order to line-up the truck on Lane 7 and manoeuvred the truck in reverse gear for the final parking position. The O/S proceeded aft to the port side of the Upper Deck towards the final parking position of the truck. The Bosun saw the truck going forward port side and he proceeded giving instructions to the following vehicle which arrived on Upper Deck (Lane 4 forward) and assisting its driver who was required to turn the large vehicle. The A/B was instructed by the Bosun to assist the second vehicle's driver on the rear side and the Bosun was at the front side of the vehicle. Both the Bosun and A/B had no view of the proceedings for parking of the first truck (they declared that their vision between their position and the place of the accident was blocked). No eye witness of the accident was available.

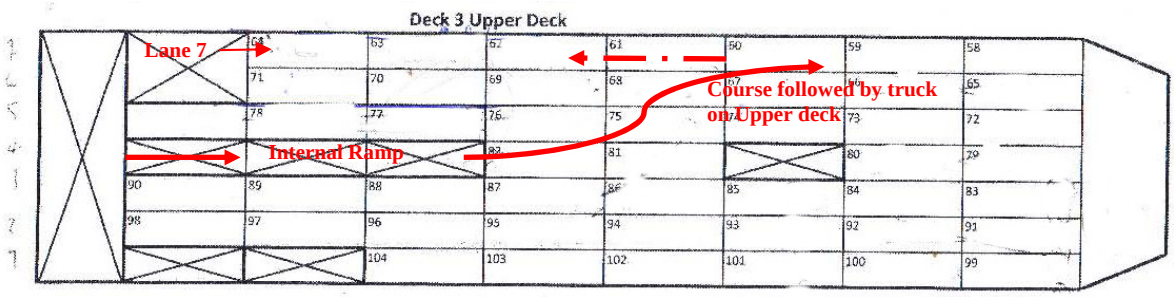

Figure 4: Course followed by the truck on Upper Deck (Deck 3)

5. The Bosun heard the driver of the truck who should park aft at Lane 7, yelling. He saw the driver running towards the internal ramp. While running after him to see what had happened he noticed the O/S lying under the truck.

Figure 5: View of the accident from the top of the internal ramp

The truck was approximately in the middle of the inclined deck of upper deck port side, within the two yellow lines. The A/B followed the movements of the Bosun. The time was approximately 21.20 LT.

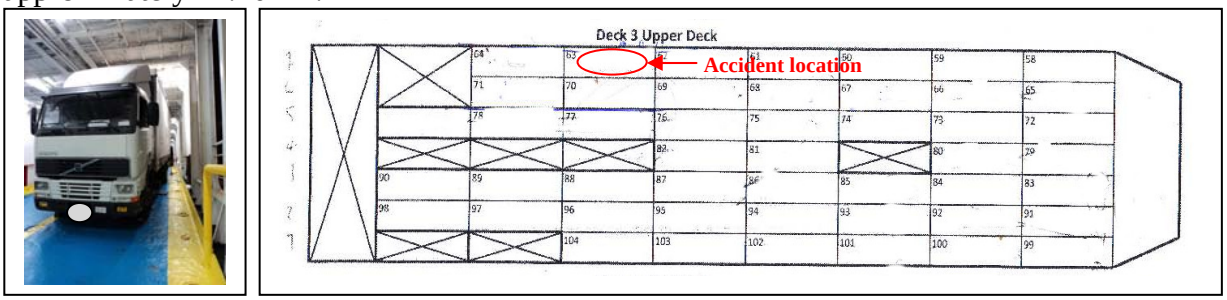

Figure 6: Position of truck at accident location

6. The Bosun immediately informed via portable radio the Chief Officer. All holders of portable radios heard the notification.

7. The truck had been left with the engine running, the driver's door opened, within the boundaries of Lane 7 in the middle of the inclined port side deck approximately on frame 55.

8. The O/S was found unconscious lying in almost transverse direction to the longitudinal axis of the truck, within the yellow border lines of lane 7 with the head on the port side and the feet on starboard side. His position was between the left front and rear wheels of the truck. He

was wearing boiler suit of blue colour, orange safety vest, safety shoes. His helmet was found lying next to him. (Police Statement)

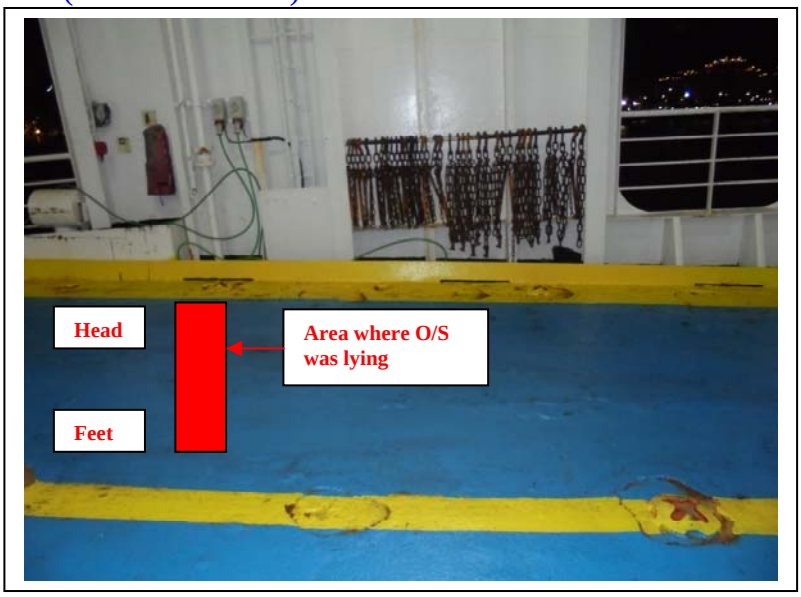

Figure 7: Position of deceased person

9. Master, who had heard the Bosun on portable radio, called the ambulance by telephone (18/07/2017-21:21). (Completed C.08/PO812-Medical assistance form). The Master attended the scene together with other crew for providing first aid.

10. The O/S had pulse, however he appeared to be in critical condition. Crew initiated the procedure for giving the first aid, however the ambulance arrived very soon and before the crew could provide any assistance.

11. Ambulance attended the vessel (18/07/2017-21:28). The attending medical personnel made efforts to resuscitate the O/S.

12. Police force and 2nd ambulance arrived on the scene (18/07/2017-21:33) (Police Statement)

13. The medical personnel declared the O/S dead (18/07/2017-21:39) (Master's Statement)

14. When attended the scene, the Master instructed the attending personnel to lash the truck at the position as found, put brake guides at the rear wheels (due to the deck inclination) and turn-off the truck's engine. Master informed the ship management company.

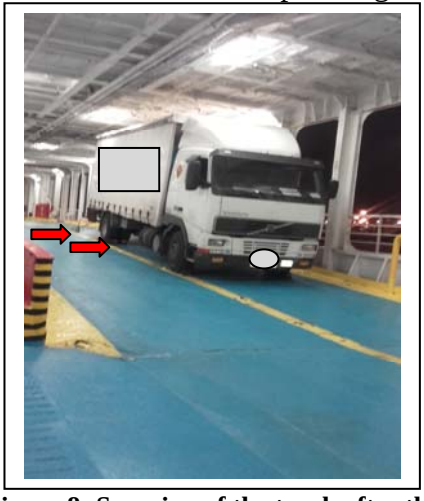

Figure 8: Securing of the truck after the accident

15. Request for forensic surgeon (18/07/2017-21:40) (Police Statement)

16. The truck stevedore driver was transferred for drug and alcohol test (18/07/2017-21:42) (Police Statement)

17. Forensic surgeon arrived on-scene (18/07/2017-22:35) (Police Statement)

18. Funeral service personnel arrived on-scene (18/07/2017-22:48) (Police Statement)

19. I-42 unit communicated that the truck driver was found with negative results for drug and alcohol test (18/07/2017-23:23) (Police Statement)

20. The O/S corpse was removed from the vessel (18/07/2017-23:50) (Master's Statement)

21. Officials disembarked the vessel and deceased person was transferred to the Institute of Legal Medicine (18/07/2017-23:58) (Police Statement)

22. Crew commenced cargo operation (19/07/2017-00:15) (Police Statement). The truck was parked at its final parking position 64 and sailed with the vessel.

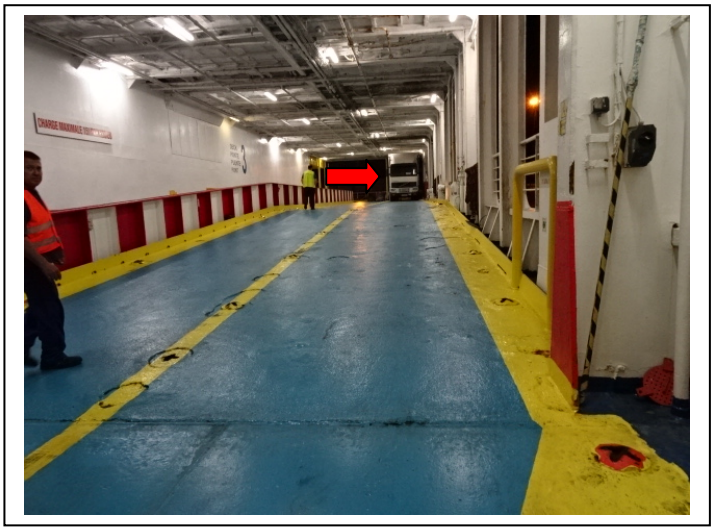

Figure 9: Truck final position before departure

23. Vessel departure (19/07/2017-01:40) (Police Statement)

4. Analysis

(The purpose of the analysis is to determine the contributory causes and circumstances of the accident as a basis for making recommendations to prevent similar accidents occurring in the future).

The following analysis is based on interviews, reports and documents provided.

4.1 The Ordinary Seaman (O/S) – Deceased crewmember

4.1.1 Certification

The following Seafarer's Certificates of the deceased person (Ordinary Seaman), issued by the Bulgarian Maritime Administration were presented to the investigator:

1. Basic Safety Training	Valid until: 30/09/2018
2. Training for Seafarer with Designated Security Duties	Valid until: Unlimited
3. Crisis Management and Human Behaviour Training	Valid until: 07/11/2018
4. Training in Passenger ship Crowd Management	Valid until: 07/11/2018
5. Safety Training for personnel providing direct services to passengers in passenger spaces	Valid until: Unlimited
6. Training in passenger and cargo safety and hull integrity	Valid until: 07/11/2018
7. Rating Forming Part of a Navigation Watch	Valid until: Unlimited
8. Proficiency in survival craft and rescue boat other than fast rescue boat	Valid until: 15/5/2019
9. Training in Marine Environmental Awareness	Valid until: Unlimited

"Crew lack of certification" was not a contributory factor to the accident.

4.1.2 Medical Fitness

The Ordinary Seaman's "Seafarer Medical Fitness Certificate" was valid until 19/05/2019. The certificate was issued by medical practitioner in Bulgaria in accordance with the STCW, Regulation 1.2 of the MLC 2006 and medical fitness requirements for seafarers in the Republic of Bulgaria are available. The seafarer was declared medically fit with no restrictions.

The last available "Drug and Alcohol Test" of the deceased person made available to the investigator was dated 10/7/2015 and it was carried out in home country. All results were negative.

The list of personal belongings of the deceased person includes among others, blood pressure measuring apparatus and vision glasses (two pairs). (List was presented to the investigator) There was no objective evidence, indication or statement that the blood pressure measuring apparatus and vision glasses were for personal use by the deceased person and cannot be determined if these were contributory factors to the accident.

Although "Crew medical fitness" at the time of his signing-on onboard was not a contributory factor to the accident, due to lack of recent evidence for drug and alcohol examination prior to his recruitment, the "lack of drug and alcohol examination prior to recruitment" could be considered that may have been a contributing factor to the accident.

4.1.3 Seafarer Employment Agreement

Contract of employment dated 15/03/2017, between the Crew Manager's company as agents for the vessel's owner and the Ordinary Seaman (O/S) for service on board MV "Denia Ciutat Creativa" (4 months ± 1 month), properly signed by both parties was presented to the investigator. The terms and conditions applied and directly referred to in the contract are "ITF Cruise TCC Agreement FIT/CISL – Part I & II".

The owning / ship management company maintains "CREWMAN A (COST PLUS FEE) 2009" of BIMCO crew management agreement with the Crew Manager company dated 04/03/2016, properly signed by both parties. M.V "Denia Ciutat Creativa" is included in the ANNEX "A: of the agreement.

"Crew employment terms" was not a contributory factor to the accident.

4.1.4 Seaman's Previous Experience

According to the Cyprus Flag Seaman's Book, the Ordinary Seaman was engaged and discharged:

MV "SCANDOLA"	Type: RO-RO PAX	O/S	11/07/2015	06/09/2015
MV "DENIA CIUTAT CREATIVA"	Type: RO-RO PAX	O/S	06/06/2016	26/09/2016
MV "DENIA CIUTAT CREATIVA"	Type: RO-RO PAX	O/S	20/11/2016	09/03/2017
MV "DENIA CIUTAT CREATIVA"	Type: RO-RO PAX	O/S	05/06/2017	---

Since July 2015 the deceased person served onboard MV "Denia Ciutat Creativa" three completed contracts of employment as ordinary seaman, one of which was under the same vessel's previous name, owner and ship manager.

"Crew experience" was not a contributory factor to the accident.

4.1.5 Working Language

The working language of the vessel is the English language. The ordinary seaman had an "ISF Marlins English Language- Test for Seafarers Certificate" dated 20/12/2015 with score 92%. There was no any evidence to suggest that the deceased person faced language communication problems with his colleagues.

Furthermore, there was not any communication problem regarding the working language between the crew and the stevedores during the loading of the vessel, as all communication was done through gestures and whistle. Any other way of communication would have been choked out by the noise of trucks moving around on deck.

"Crew language communication" was not a contributory factor to the accident.

4.1.7 Familiarization training

Records properly signed by all required personnel for the deceased person's familiarization training in accordance with company's Safety Management System, Chapter 07, Doc. Number: C.07/PG.003 – Ship's familiarization and instructions were presented to the investigator, as follows:

1. Annex I: Receipt of information delivered to the new personnel, dated 05/06/2017
2. Annex II: Information to be delivered to the new personnel
3. Annex III: Checking list on Familiarization, dated 05/06/2017
4. Annex IV: Questionnaire on checking the familiarization, dated 10/06/2017
5. Annex V: Registry of the Reception of the equipment for individual protection, 06/06/2017 dated

Records relevant to ordinary seaman's previous sign-on familiarization training (e.g. Annex I and Annex V –see above) dated 20/11/2016 were properly signed and presented to the investigator.
In addition, "Crewmember's Pre-engagement briefing and acknowledgement of company policies" form C606A, which includes commitments about drug and alcohol regulations, dated 18/05/2017 was found properly signed by the deceased person.

Taking into consideration the task carried out by the O/S, the previous experience onboard the same vessel with same duties and the familiarization training records, "Crew Training" was not a contributory factor to the accident.

4.1.8 Fatigue

"Table of shipboard working arrangements" dated 15/05/2017 was found completed and properly signed by the Master, covering the working arrangements of O/S for non-watchkeeping duties only between the following periods (06:00-07:30; 08:30-14:30; 20:00-23:30).
The Working and Resting period record of O/S was found completed. The limitations on minimum rest periods were found in accordance with the requirements of MLC, 2006 Ratification Law of 2012 of the Cyprus Flag Administration issued in conformity with the ILO Maritime Labour Convention, 2006 and the relevant STCW regulation for the days 17/07/2017 and 18/07/2017.
The actual working hours of the W&R period do not match with the duty hours of the table of shipboard arrangements.

"Crew fatigue" was not considered a contributory factor to the accident.

4.1.9 Working and Living Conditions

On the basis of the interviews and the investigation onboard, there was no evidence to suggest, that, the "working and living conditions" was a contributory factor to the accident.

4.1.10 Physiological, Psychological, Psychosocial Condition

On the basis of the interviews during the investigation onboard, there was no evidence or indications to suggest that the O/S physiological, psychological, or psychosocial condition was such that could have contributed to the accident. It was stated from interviewees that he was physically and mentally fit to perform his job.

However, in accordance with the final post mortem toxicology report (further information is provided in the following paragraph), the deceased person was found with a blood ethanol (alcohol) content of 1.93 g/l (grams per liter). In accordance with the medical toxicology publication referenced in the post mortem toxicology report, the following effects could be produced:

For concentration of 0.9 – 2.5 g/l:

- emotional instability and decreased inhibitions;
- loss of critical judgment;
- alterations of memory and comprehension;
- decreased sensory response;
- increased reaction times;
- muscular incoordination.

It is noted that the level of impairment may vary from one person to another and can be affected by such factors as genetics, adaptation to chronic alcohol use and synergistic effects of drugs.

Due to the blood alcohol concentration, the "Influence of alcohol and ensuing impairment of mental and physical condition" of the deceased person could be considered that may have been a contributing factor to the accident.

With due consideration to the possible visible effects that could result from a blood ethanol (alcohol) content of 1.93 g/l and failure of the other involved crew members to detect that the mental and physical condition of the deceased person was impaired, the "lack of effective supervision" could be considered that may have been a contributing factor to the accident.

4.1.11 Post Mortem Examination

According to the judicial Court dossier and on the basis of the:

1. external examination of the corpse in place, the provisional conclusion was the accidental violent death of the O/S due to thoracic-abdominal trauma and destruction of vital organs.
2. Preliminary conclusions of forensics, the cause of death of O/S was traumatic shock (hemothorax, hemoperitoneum, liver lacerations).

According to the final toxicology report issued by the Spanish Authorities the following results were stated:

1. Blood: Ethanol 1.93 g/l. Caffeine was also detected in the analyzed sample.
2. Urine: Ethanol 2.7 g/l. No drugs or other substances examined by the Authority were detected in the analyzed sample.

"Alcohol concentration in blood" of the deceased person could be considered that may have been a contributing factor to the accident.

4.2 The Ship

The vessel's crew was multinational. The official language onboard is the English language. The vessel was manned with totally 53 seafarers before the accident on 18/07/2017, including the deceased person, well in excess of the Minimum Safe Manning Document requirements.

The vessel at the time of the accident, had valid all statutory and class certificates including the SMC and DOC certificates (ISM Code). The vessel is classed by an IACS Classification Society, whereas the ISM related certificates are issued by another IACS Classification Society. There were two overdue machinery items on 27/07/2017, which however were irrelevant to the accident. (Survey Status dd 27/07/2017).

Flag Administration (Certificates presented to the investigator)	Date survey	Date expiry
Certificate of Registration	11/04/2016	---
Minimum Safe Manning Certificate	11/04/2016	---

Statutory ISM / MLC Certificates (IACS Class) (Certificates presented to the investigator)	Date survey	Date expiry
DOC	19/12/2016	24/09/2020
SMC	07/10/2016	07/10/2021
Maritime Labour Certificate	07/10/2016	07/10/2021

Class and Statutory Certificates (IACS Class) (Obtained from Survey Status dated 27/07/2017, which was presented to the investigator)	Date survey	Date expiry
Class	24/05/2017	20/06/2022
Load Line	24/05/2017	20/06/2022
SOLAS Passenger Ship Safety Certificate	24/05/2017	20/06/2018
SOLAS Dangerous goods	24/05/2017	20/06/2022
MARPOL Annex I Oil Pollution Prevention	24/05/2017	20/06/2022
MARPOL Annex IV Sewage certificate	24/05/2017	20/06/2022
MARPOL Annex VI Prevention Air Pollution Certificate	24/05/2017	20/06/2022
MARPOL Annex VI IEE Certificate	09 May 2016	---

Port State Control inspection was carried out by the Maritime Authority the day after the accident, when the vessel called Barcelona port, without deficiency. (PSC report dd 19/7/2017 was presented to the investigator) No history record for PSC detention was found. (Equasis-Ship Info dd 03/08/2017)

A survey for the safe operation of regular Ro-Ro and high speed passenger craft services in accordance with the Council Directive 1999/35/EC was carried out on 23/03/2017 at port of Algeciras without any deficiency noted. (Report of Survey dd 23/03/2017 was presented to the investigator)

The vessel is furnished with a "Cargo Securing Manual" approved by the Classification Society.

The vessel's medical locker was verified to be in order during the attendance of the Investigator. However, due to the severity of the accident and as the vessel during the accident was at Barcelona port, first aid was provided by the ambulance personnel.

The vessel had an internal CCTV system, however there are no provisions for recording and at the time of the accident nobody was monitoring the bridge located monitor.

There was no evidence of any "vessel's defect or malfunction" that could have contributed to the accident.

4.3 The Environment

4.3.1 External environment

The weather conditions at the time of the accident were:

- Sea State: Calm
- Wind: ---,
- Day/Night: Twilight
- Sky: ---
- Visibility: Very good

There were no sudden movements of the vessel, which could have caused the deceased person to slip or lose his balance. There is no evidence that physical external environmental factors, such as weather, climate, etc., affected the actions of the persons involved in the accident, thus the "external environment" could have not contributed to the accident.

4.3.2 Internal Environment

Three (3) decks of garage spaces are available onboard; Upper deck, Main Deck and Tank Top deck. The stowage plan refers to car decks as follows: Upper deck as "Deck 3", the Main Deck as "Deck 2" and Tank Top deck as "Deck 1". The vessel is furnished with one stern ramp / door on Main Deck, which is the embarkation access to the vessel. There is an internal ramp leading to Upper deck in line with the stern ramp /door starting on frame 15.

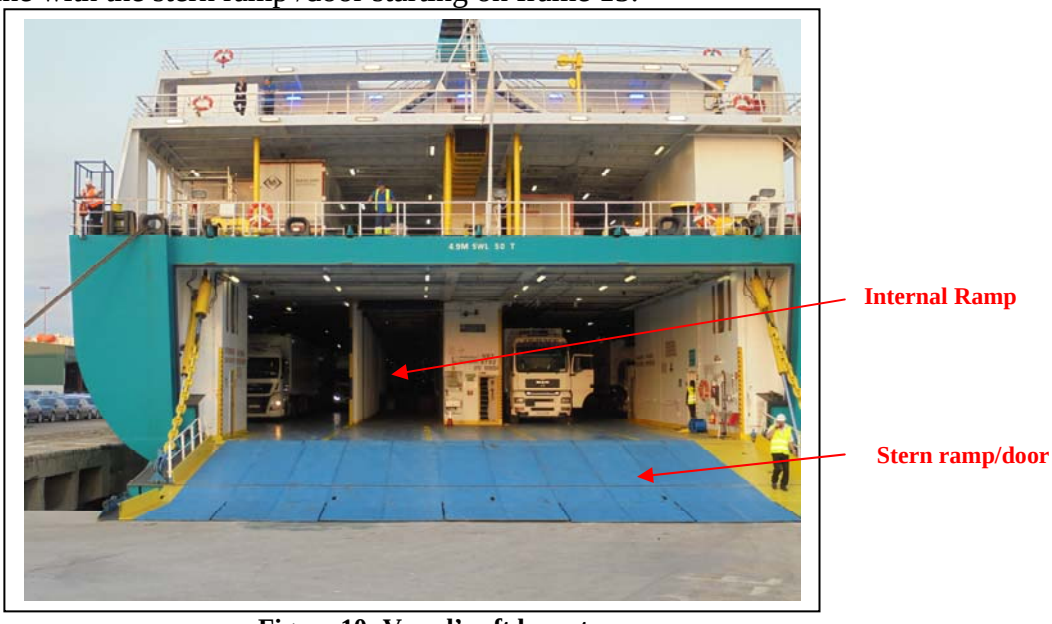

Figure 10: Vessel's aft layout

On Upper deck, port and starboard of the internal ramp, the deck is inclined (rising aftwards) between the frames 47 and 65. The accident occurred approximately in the middle of the inclined deck on the port side.

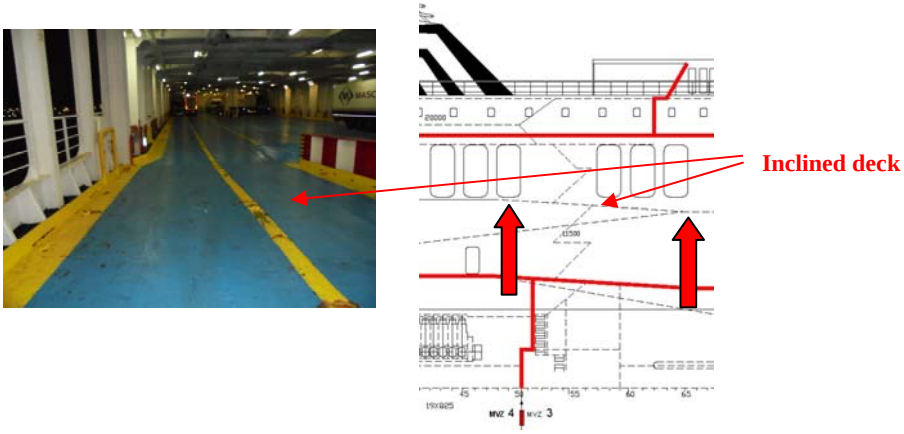

Figure 11: Upper Deck (Deck 3) inclined deck

The Upper Deck is divided into seven (7) lanes for vehicle stowage purposes starting from Lane 1 on the starboard side and ending with Lane 7 on the port side of deck.

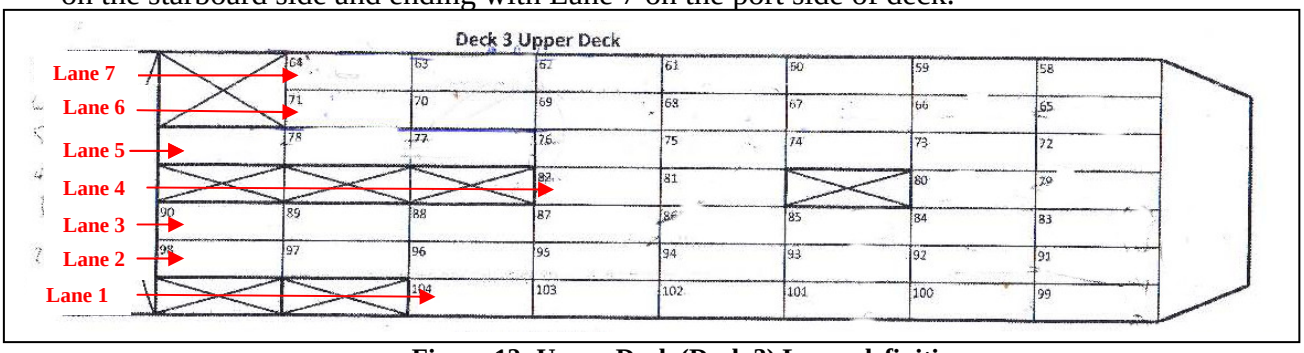

Figure 12: Upper Deck (Deck 3) Lanes definition

The Upper Deck is furnished with side shell openings port and starboard for natural ventilation of the space.

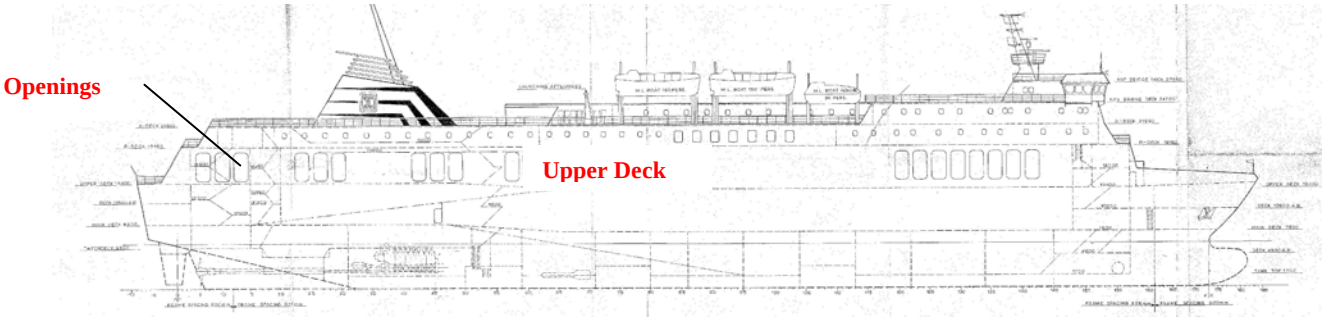

Figure 13: Upper Deck (Deck 3) side openings

The accident occurred within garage space on Upper Deck (Deck 3) port side aft. The environment within the garage space at the time of the accident (21:20 LT) was as follows:

- the space was naturally ventilated through openings in side and aft shell;
- the temperature was normal;
- the humidity was limited within the garage space, although the side openings allow some humidity to enter the space (no indications that deck could be slippery when wearing safety shoes);
- the lighting was satisfactory (taking into consideration the twilight external condition);
- the marking of the garage space was clear, the lines defining lane borders being of yellow colour and clearly visible;

- The sun during sunset time cannot blind the stevedore driver due to the berthing position of the vessel.

Minor leakages and vehicle oil stains on deck may appear (there is no evidence of such existence at the time of the accident). All leakages and oil stains are removed after every discharging operation (standard shipboard practice as stated by Bosun).

The fixed securing devices are of "flush lashing pot" type (reference is made to drwg S80.0957.234.01/Sheet 1/3-Lashing Equipment on Car Deck) without sharp edges (dome slightly protruding) and are located within the parking lanes which are indicated with yellow colour lines

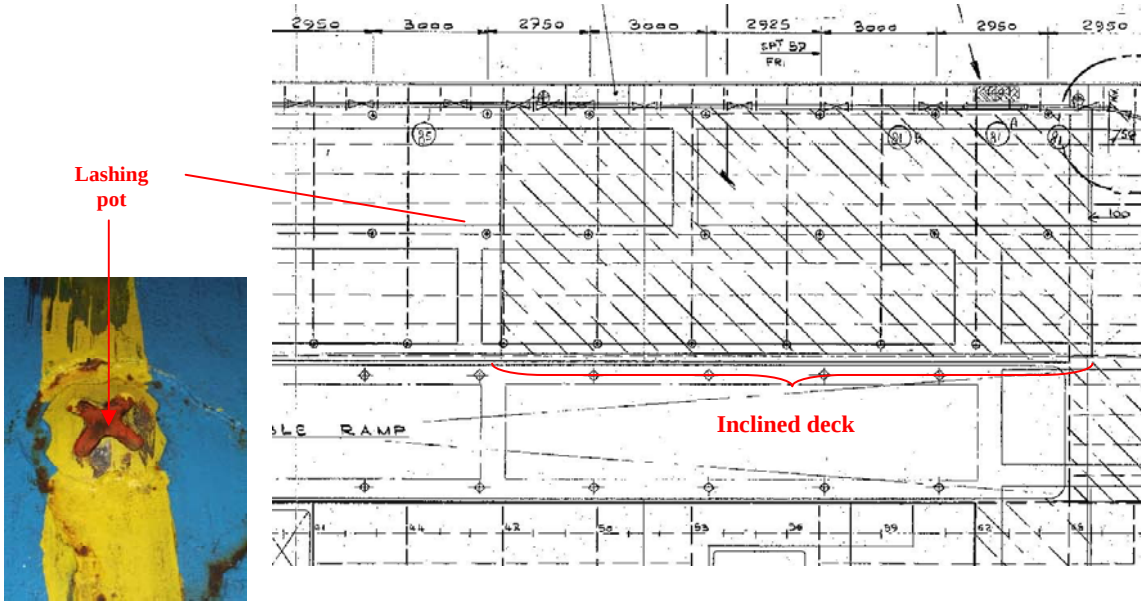

Figure 14: Upper Deck (Deck 3) lashing pots

There is no evidence that loose obstacles, securing chains or cables were found in the garage space at the time of the accident (during loading operation). As stated by the Bosun, it was standard practice after every discharging operation and before commencement of the loading operation, the garage space is tidied-up and any leakage/stains are removed by the crew members. In addition, no lashing chains were used during the last voyage before the accident, no electrical cables were used (loaded reefer vehicles are usually transferred from Barcelona to Ciudadela (Menorca) and return empty without the need for plugging).

At the time of the accident, the maneuvering area of the truck and the final parking position on Upper Deck (Deck 3) were free from other vehicles. This truck was the first truck parking on the port side aft area. There was no other vehicle in the driver's or O/S vicinity to block their line of view.

The Upper Deck port side, at the location where the accident occurred, has an upwards inclination in the aft direction, which may have led the stevedore driver to suddenly accelerate the truck. The truck speed during manoeuvring in reverse is generally kept very low due to practical reasons however the "deck inclination" requires the driver to suddenly accelerate the truck.

There is no evidence of mobile phone next to the body in order to suggest that the O/S was concentrated on something else and he did not notice the movement of the truck.

There were no loose items which could have caused the deceased person to make a sudden move to collect them and get in way of the moving truck.

There were no reported leakages / stains which could have caused the deceased person to slip or lose balance and thus fall at the rear side of the truck. Despite this, it cannot be excluded that some unnoticed leakage or grease stain could exist. Hence, the “slippery surface or slippage” could be considered that may have been a contributing factor to the accident.

Although the protruding domes of the lashing pots are low and smooth, it cannot be ruled out that the O/S could have tripped on one of those and lost his balance, thus the “lashing pots” could be considered that may have been a contributing factor to the accident.

4.4 Safety Management

4.4.1 Key shipboard operations and risk assessment

The company's Safety Management System and the Occupational Risk Prevention Sheet dated September 2016 were presented to the investigator. The company's DPA, who has been assigned as DPA of the company since January 2017, stated that there was no incident and accident in the past involving drivers onboard any of the vessel managed by the company, as far as he knew. Same was declared by the vessel's Master.

According to the company's preliminary accident investigation report dated 22/07/2017 the following reference documents are provided to the crewmembers for vehicles operations:

- In the familiarization form under the titles "embarkation and disembarkation of vehicles in conditions of low visibility, e.g. during hours of the day when there is little visibility" and works in the ship's garage: lashing of loads, placement of vehicles and trailers. Circulation between vehicles".
- Risk: Accidents or blows caused by vehicles – "Instructions" and "Protection equipment to use".

However, this is part of the "Occupational Risk Prevention Sheet" dated September 2016 which is a generic risk approach with general preventive measures. This is referred in the familiarization procedure "Doc. Number: C.07/PG.003 - Ship's familiarization and instructions" under the title "PLR Card".

On the basis of the interviews, the loading operation procedure is implemented onboard and it appears to be well known by the involved crewmembers:

- The vessel's loading operations are organized by the Chief Officer who is standing on the stern ramp and giving instructions to the drivers (private or stevedores) to which deck they should drive their vehicles. This is also communicated to the responsible crewmembers for receiving the vehicles on each deck advising the designated parking place via portable radio. The "recipient" crewmember informs the driver which his designated parking position is, following the instructions of the Chief Officer. The "recipient" instructs the assisting crewmember (normally there are two crewmembers available) accordingly, who is then responsible to guide, help and provide further instructions to the drivers to park. There is always an assigned crewmember for each vehicle for providing guidance to the drivers.
- The crewmembers should always guide the vehicles from a position where the drivers can see them and the drivers should be aware of the crewmember in the vicinity. The crewmembers shall move to the "safe zone" of the trucks giving them space for free movement, avoiding entrapment between fixed structures and the moving vehicles. The crewmembers communicate with the drivers with hand signals / gestures and with whistles. The crewmembers should wear overall, reflective vest, safety shoes and helmet, as required also by the labour risk evaluation (information given by company's DPA).

The common procedure for guiding the vehicles to park was to communicate positions between driver and crewmember by the use of gestures, signals and, in urgencies, the use of whistles. According to the stevedore driver statement, no visual contact was established between the driver and the crewmember at any stage of the maneuvering.

Non-establishment of visual contact from the initial stage of the manoeuvring indicates a failure to implement the safety guidelines and procedures, either verbal or documented, by the stevedore driver and the O/S.

The "Failure to implement the safety guidelines and procedures, either verbal or documented" could be considered that may have been a contributing factor to the accident.

No documented procedure was found in the Safety Management System relevant to the working method/instruction for vehicles guidance when loaded or discharged, even if the task can be considered as routine operation not requiring specialized skills from the crewmembers.

4.4.2 Drug and Alcohol procedure

The company has established within the SMS documented procedure for "Alcohol and other drugs" as per Doc. Number C07/PG.012 of the SMS. The company has zero tolerance policy for carrying drugs and alcohol onboard vessels under management, the consumption of alcohol and drugs is absolutely forbidden onboard and additionally the company could establish crew checks for alcohol and other drugs. The procedure states that the company provides certified spirometers to the vessels for carrying out random and voluntary alcohol tests among the crew members. In addition, the procedure requires random blood alcohol content test, carried out by independent authorized agency. The procedure does not define specific intervals for the checks. Furthermore it is not clear whether the checks are applicable to the whole crew or to the watch personnel only.

There was no objective evidence that the deceased person was tested as per the above procedure. In addition, the existence of ethanol in the blood of the deceased person is an indication that the aforementioned procedure and policy was not properly implemented on board this vessel.

The "Poor implementation of the drug and alcohol procedure onboard the vessel" could be considered that may have been a contributing factor to the accident.

4.4.3 Other related issues

The vessel's official Log Book was checked and found as per Cyprus Flag requirements. The accident was recorded in the log book dated 18/7/2017.

"Instructions to be Filled in, in all cases of Medical Assistance on board, with or without radio-medical consultation", doc. Number C.08 / PO 812 – Medical Assistance of the Safety Management System Chapter 8 was found properly completed. (Record was presented to the investigator)

During the visits of two Marine Accident Investigators, the crew was found bearing the appropriate Personal Protective Equipment, i.e. Overall suit, safety shoes, helmet, orange reflective vest, and whistle. The use of whistle was verified during the operations.

During the visits of two Marine Accident Investigators, the truckers were not driving very fast or in an unsafe manner.

The Master declared that the DPA was notified by him, the Crew Manager was notified by email officially by the Master upon departure. The DPA declared that he officially informed the Cyprus

Flag Administration next day and that the company's Fleet Manager verbally informed the crew manager same day of accident.

Irrelevant findings:

1. No medical log book was found onboard. A form describing the medical treatment was provided without mentioning names of the persons requiring medical assistance. The DPA stated that majority of the medical cases are outsourced to external clinic and the relevant form of the MSC/Circ.1105 is completed.

4.5 Shipmanagement Company

The ship owner and ship manager is a Spanish shipping line providing passenger and cargo services to the Balearics with daily connections between the islands and the mainland (via the ports of Barcelona, Valencia and Denia). It operates inter-island to all four islands of the archipelago and also in the Straits of Gibraltar linking Ceuta and Melilla to mainland ports. At the international level, the company operates the Algecrias-Tangier (Morocco), Almería- Nador (Morocco) and Valencia-Mostaganem (Algeria) crossings, while also offering services between Fort Lauderdale (Florida, USA) and the island of Grand Bahama, under the Baleària Caribbean brand. It was established in 1998 and presently manages 24 vessels (ferries and fast ferries). On the basis of the public figures of 2016, 3.5 million passengers, 5.0 million lane meters of cargo, 750000 vehicles were carried onboard 25 vessels within the year.

The ship management company maintains a Document of Compliance in accordance with ISM Code. In addition, the company is certificated against ISO 9001:2008 and ISO 14001:2004 with expiry date 14/07/2018 and with certification scope “Maritime Transport of passengers and Ro-Ro by regular lines and ships agents”.

There was no evidence to suggest that the experience of the ship management company for managing Ro-Pax vessels was such that could have contributed to the accident.

4.6 Stevedores

4.6.1 State Stevedore Company

The State stevedore company works in the port of Barcelona. It acts as a job placement office where the stowage companies must hire their workers for specific jobs. An agreement between the ship management company and the stevedore company was presented to the investigator.

In addition, an associate company provides services for labour risk prevention and tracking of activities. This company provided analysis of the accidents occurred onboard RO-RO and RO-PAX vessels involving stevedore activities for the last three years. On the basis of the submitted information the accident under investigation is the only fatal accident to occur since 2013, whereas another serious accident (non-fatal) was noted in 2014. A total number of eight minor accidents were noted onboard ro-ro and ro-pax vessels at the port of Barcelona during the aforementioned period.

There was no evidence to suggest, that the "stevedore company's experience and practices" was contributory factor to the accident.

4.6.1 Stevedore Driver

The following analysis refers to the stevedore who was driving the truck which was involved in the accident.

- Training:

  The stevedore driver attended several training courses since 2002. According to the training records provided by the stevedore company, he attended training courses relevant to his assigned duties ("MAFI-RoRo tractors") and the last training course attended was carried out on 13/01/2015. The stevedore driver during his interview stated that all stevedores receive a continuous training in Labour Risk Prevention and tracking of activities, through a dedicated service inside the company responsible for labour risk prevention.

  "Stevedore driver lack of training" was not a contributory factor to the accident.

- Medical Condition

  The stevedore driver was permanent employee of the stevedore company. During his interview he declared that he did not suffer from any disease, neither is taking any medication.

  There was no evidence to suggest that "Stevedore driver's medical condition" was such that could have contributed to the accident.

- Experience

  The stevedore driver has experience on RO-PAX of totally 85 shifts within 2017 whereas the total on RO-PAX since 2004 is 736, and total experience for a variety of assignments is 2484 shifts. During his interview he stated that he was usually working with ROPAX vessels and had specialized in being driver of "MAFIs" (RoRo tractors), however, he could act also as

driver of trucks and it was a common task for him. The stevedore driver had been appointed as stevedore onboard MV "Denia Ciutat Creativa" at least another one day within July 2017.

"Stevedore driver's experience" was not a contributory factor to the accident.

- Employment

The stevedore driver stated that he is employed by the stevedore company since 02/12/2002. He also stated that his contract is for permanent employment.
Following the standard procedure for requesting stevedores from the stevedore company for MV "Denia Ciucitat Creativa" on 18/07/2017, the ship management company requested stevedores for the forthcoming vessel's operation on 17/07/2017. The stevedore company informed in writing the attending stevedores with relevant duties for the operation of 18/07/2017. The said stevedore driver was assigned for this operation as "MAFI RO-PAX" on 17/07/2017, thus the driver was authorized for the task.

The "Stevedore driver employment" was not a contributory factor to the accident.

- Communication

The stevedore driver stated that no verbal communication is necessary between stevedores and crewmembers during the operation. The common procedure was to communicate positions by the use of gestures and signals and, in urgencies, the use of whistles. This procedure was implemented on board MV "Denia Ciutat Creativa" where the crewmembers often use the whistles. There was no agreed standardized method of signals but the way of working is to stop immediately the movement of the truck when a whistle is heard.

The "Stevedore driver communication" was not a contributory factor to the accident.

- Fatigue

The stevedore driver stated that he was working in a low workload week, that is 5 hours work per day, from 1900 to 2400 hours depending on the movements of vessel. The accident occurred on 18/7/2017 (Tuesday) and the driver stated that he did not work in other vessel neither performed a private activity on that day. He stated that the previous night he slept 7-8 hours and additionally he slept for 30 minutes before he left his home for work.

The "Stevedore driver Fatigue" is not considered to be a contributory factor to the accident.

- Drug and Alcohol

Immediately after the accident, the stevedore driver has a drug and alcohol test by the Authorities with negative results.

The "Stevedore driver drug and alcohol" was not a contributory factor to the accident.

4.7 Truck involved in the accident

The truck involved in the accident was a medium sized truck

Figure 15: Vehicle involved in the accident

The right upper mirror ("plain rear view mirror") of the truck was found broken, which may lead to restricted visibility of the driver during reverse manoeuvring.

Figure 16: Damaged mirror

However, the driver stated that:

- he did not see the O/S at any time of the operation;
- he was aware of the broken right upper mirror ("plain rear view mirror") and he informed the foreman of the fact before getting into the vessel. The foreman asked him if he had any problem with that and he let him go ahead after he confirmed that he had no problem.
- In order to control the right side of the truck during manoeuvring, he utilized the intact lower right mirror ("wide angle rear view mirror") which is a small mirror showing objects closer. That was adequate to get the right side of the truck controlled.

The below typical diagram (not specific for the truck involved in the accident) presents the blind sector when using truck mirrors:

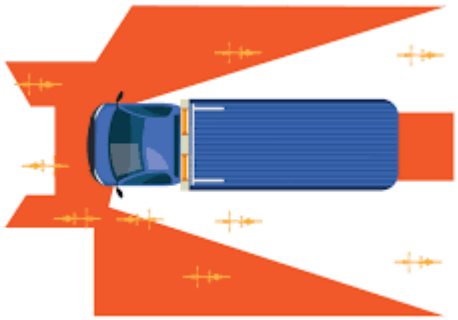

Figure 17: Schematic diagram for mirrors blind sectors (similar truck)

After detailed analysis of the photos presented to the investigator, it was evident that the final position of the truck was within safety (yellow) lines of Lane 7, however, the front wheels were slightly turned to the left.

There was no evidence to suggest, that, the truck condition was contributory factors to the accident, except of the damaged mirror which could be considered that may have been a contributing factor.

5. Conclusions

The truck ran over the O/S with the left rear wheels. Although there was no objective evidence available from the gathered information that the truck hit the deceased person (e.g. statement or photo - signs of blood, broken lights cover) prior to running over him or that the deceased person may have lost consciousness (and was not hit by the truck) with due consideration to the possible effects caused from his blood ethanol (alcohol) content of 1.93 g/l, the plastic mud flap of the truck which was found to have fallen off between the front and rear wheels left side indicates that the truck ran over the O/S with the left rear wheels.

Figure 18: Fallen off plastic mud flap

The O/S was found unconscious lying in a direction transverse to the longitudinal axis of the truck, within the yellow border lines of lane 7 with the head on the port side and the feet on starboard side, thus he was not standing at the left side of the truck within the safety port side safety line (the body should be half-in, half out). The O/S was most probably moving from right to left at the rear of the truck when was hit by the vehicle or lost consciousness.

In accordance with the final post mortem toxicology report, the deceased person was found with a blood ethanol (alcohol) content of 1.93 g/l (grams per liter).

Due to lack of eye witness of the accident and considering the large space which was available to the O/S for movement and taking into consideration the possible effects caused from his blood ethanol (alcohol) content of 1.93 g/l, the reasons for the O/S being behind the truck cannot be reliably determined. However, according to international publications, having blood ethanol content of 1.93 g/l is considered a significant amount which could impair the mental and physical condition of the affected person and may have resulted in unsafe and risky moves. In accordance with the medical toxicology publication referenced in the post mortem toxicology report, the following effects could be produced for concentration of 0.9 – 2.5 g/l (the level of impairment may vary from one person to another and can be affected by such factors as genetics, adaptation to chronic alcohol use and synergistic effects of drugs):

- emotional instability and decreased inhibitions;
- loss of critical judgment;
- alterations of memory and comprehension;

- decreased sensory response;
- increased reaction times;
- muscular incoordination.

With due consideration of the above, there are three possibilities which may have led to O/S lying behind the truck:

1. Slippage / loss of balance (e.g. due to muscular incoordination, possible oil stains / water, tripping on lashing pots) and then run over by the truck when crossing lane 7 at the rear of the truck from right to left side.
2. Hit by the truck and then run over when crossing lane 7 at the rear of the truck (e.g. wrong positioning of the O/S caused by poor judgement, impaired depth perception, decreased sensory response, increased reaction times in combination with an abrupt increase of the truck speed due to the deck inclination).
3. Loss of consciousness and then run over by the truck due to possible effects caused from his blood ethanol content.

Irrespective of the aforementioned possible O/S actions, the stevedore driver stated that he never saw the O/S at any stage of the maneuvering and that several times he parked the trucks without the assistance of the crewmembers.

Due to the lack of eye witnesses no safe conclusions can be extracted as to the exact conditions of the accident.

On the basis of the information and data presented to the investigator and the analysis carried out, the following categories of causes were considered as the most appropriate:

Root Cause:
(If corrected, the same accident will not happen again)

The O/S presented himself for duty under the influence of alcohol (blood ethanol (alcohol) content of 1.93 g/l). This led to O/S being unfit for duty.

Direct Cause:
(The immediate events or conditions that caused the accident)

The lack of visual contact between the stevedore driver and the O/S is the direct cause of the accident. If visual contact had been established at the beginning of the maneuver, the stevedore driver would have stopped the truck when he could not see the O/S for any reason.

Contributing Causes:
(An event or condition that collectively with other causes increases the likelihood of an accident but that individually did not cause the accident)

1. The impaired mental and physical condition of the deceased person resulting from a blood ethanol (alcohol) content of 1.93 g/l may have been a contributing cause to the accident.
2. With due consideration to the possible visible effects on the behavior of the deceased person, failure of the other involved crew members to detect that the mental and physical condition of the deceased person was impaired may have been a contributing cause to the accident.
3. The poor implementation of certain parts of the safety management system (e.g. lack of drug and alcohol examination prior to recruitment, failure to implement the safety guidelines and procedures, either verbal or documented regarding the procedure for loading vehicles, implementation of the drug and alcohol procedure onboard the vessel) may have been a contributing cause to the accident.

4. The deceased person ending-up lying behind the truck during his movement due to any of the following reasons: wrong position, loss of balance, loss of consciousness, slippage (slippery surface), tripping (lashing pots), may have been a contributing cause to the accident.
5. Routine procedure from stevedore driver may have led to over self-confidence, which resulted in carrying out the operation without the need of assistance by a crew member, may have been a contributing cause to the accident.
6. The impaired rearwards visibility of the truck driver due to damaged mirror may have been a contributing cause to the accident.

6. Recommendations

(With Time limit i.e., Within 3 months)

1. For the Management Company:
   a. The Safety Management System procedure C.07/PG.012 "Alcohol and other drugs" to be revised in order to ensure that scheduled and unscheduled alcohol tests will be carried out at specified intervals for all crew members, as per the ISM Code, clause 6. (Within one month)
   b. The Safety Management System Chapter 6 "Resources and Personnel" to be revised in order to ensure that seafarers will be subject to drug and alcohol examination by medical practitioners at their home country prior to their embarkation irrespective of the number of previous contracts completed with the company. The company to ensure that crew managers and / or manning agents are made aware and implement the new requirements, as per ISM Code, clause 6. (Within one month)
   c. The company to ensure that the safety management system is effectively implemented onboard covering all sections of the ISM Code, as per ISM Code, clause 12. (Within three months)
   d. The Safety Management System to be revised in order to include procedure / working method / instructions for vehicles guidance when loaded or discharged under the ISM Code, clause 7.
   e. Appropriate signs and notifications to be posted in entrances and garage areas of the vessels, ensuring that, as a minimum, the following safety instructions must be strictly adhered to by both crewmembers and drivers (Within one month):
      - All vehicles shall always be assisted for parking by a crewmember.
      - Visual contact with the crewmember to be always maintained.
      - Stop immediately the vehicle when losing visual contact or when hearing whistle.
   f. Guidelines to be provided for training purposes to the crewmembers involved in assisting vehicles for parking indicating the safe zone for crew movement and the reverse blind sector of drivers for several types of vehicles (e.g. private cars, articulated trucks, lorries etc). Training to be provided to all personnel involved. (Within three months)
2. For the Vessel:
   a. The Master to ensure that the requirements of the safety management system are properly implemented by all crew members. (Within one month)
   b. The Master to enhance a safety culture on board encouraging crewmembers to report any unusual behavior of any crew member. (Within one month)
3. For the Stevedore Company:
   a. The vehicles drivers to ensure that whenever they do not have visual contact with the assigned parking guide, they should stop their vehicles until achieving visual contact, especially in reverse manoeuvring. (Within three months)

The following recommendations were derived during the course of the investigation of the accident, are not related to the accident and are presented herebelow for consideration by the Management Company:

1. The Safety Management System and Occupational Risk Prevention Sheet to be duly revised in order to ensure that:
   - The risk assessment for cargo operations to be more detailed regarding the hazards, counter measures to mitigate the risk covering individual tasks.
   - Apart of the generic risk assessment sheet, provisions to be made for carrying out specific risk assessment, in case the parameters which were taken into consideration during the development of generic risk assessment changed.
   - Text in language other than English must be translated into English language which is the official language of the vessel.
   - Medical log book to be developed in the SMS in order to describe all medical cases (onboard the vessel or ashore)
2. The actual working hours recorded in the W&R periods, to match with the duty hours of the table of shipboard arrangements.