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Air, Maritime and Railway Traffic Accidents Investigation Agency
Maritime Accident Investigation Department

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FINAL REPORT

ON VERY SERIOUS MARINE CASUALTY
of the m/v “Fidelity”

Bay of Raša, 22 June 2018



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FOREWORD

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The founder of the Agency is the Republic of Croatia, and the founder's rights are exercised by the Government of the Republic of Croatia.

The Agency is functionally and organizationally independent of all authorities responsible for air, maritime and railway traffic and of all legal and natural persons.

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Marine Accident Investigation Department is autonomous and independent department of Agency that performs, on the basis of public authority, professional tasks related to the initiation and conducting of safety investigations with the aim of determining the cause of marine casualties and incidents, the publication of the results of the conducted safety investigations and issuing safety recommendations for prevention of marine casualties and incidents in the future, improving maritime safety and reducing the risk of pollution by vessels.

Safety investigations are conducted independently of any other investigations, and such investigations do not have and cannot have influence on conducting safety investigations or the results of these investigations.

Initiating and conducting safety investigations cannot be precluded, suspended, postponed, or in any way restricted, by reason of any other parallel investigations whose aim is to determine liability or apportion blame.

A common methodology for the safety investigations of marine casualties and incidents, developed in accordance with Directive 2009/18/EC of the European Parliament and of the Council, including the use of methodologies and guidelines developed by the International Maritime Organization (IMO) and European Maritime Safety Agency (EMSA) shall be applied to initiation and conducting the safety investigations.

The purpose of a marine safety investigation is to identify the possible causes and contributing factors which contributed to marine casualty or incident, in order to improve maritime safety, prevent future casualties and incidents and reduce the risk of pollution by vessels, as well as to propose safety recommendations based on analysis and conclusions of the investigation, which may relate to



amendments to the regulations, improvement of working procedures on board, the manner of conducting inspections, ship management, health and safety at work, maintenance and repairs, crew training, coastal assistance procedures, emergency preparedness, etc.

The safety investigation does not create a presumption of liability or blame and the Final report has not been written, in terms of content and style, with the intention of it being used in legal proceedings. However, Marine Accident Chief Investigator and other Investigators in charge of the investigation or participating in investigation must not refrain from complete and truthful reporting about the causes of the marine casualty or incident, even when the blame or responsibility can be concluded from the results of the safety investigation.

The safety recommendations are addressed to those that are best placed to implement them, such as ship owners, managers, recognised organisations, maritime authorities, vessel traffic services, emergency bodies and/or European Commission.

Safety recommendations shall in no circumstances determine liability or apportion blame for a marine casualty or incident.

Each safety investigation of marine casualty or incident shall be completed by the publication of the Final report on the results of the conducted safety investigation in accordance with Annex I of the Regulation on the Manner and Conditions for Conducting Safety Investigations of Marine Casualties and Incidents (Official Gazette no 122/15).

The final reports shall be published in a form that corresponds to the type and seriousness of marine casualty or incident.



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1. CODES AND ABBREVIATIONS

AIA – Air, Maritime and Railway Traffic Accidents Investigation Agency

ADR – European Agreement Concerning the International Carriage of Dangerous Goods by Road

CIMIS – Croatian Integrated Maritime Information System

COC – County Operations Centre

CRS – Croatian Register of Shipping

EMSA – European Maritime Safety Agency

IMO – International Maritime Organization

ISM Code – International Safety Management Code

ISPS Code – International Ship and Port Facility Security Code

LT – Local time

MMSI – Maritime Mobile Service Identity

MRCC Rijeka – Maritime Rescue Coordination Centre Rijeka

P&I club – Protection and Indemnity Club

SMS – Safety Management System

SOPEP – Shipboard Oil Pollution Emergency Plan

UTC – Universal Time Coordinated

VHF – Very High Frequency

VTS CROATIA – Vessel Traffic Service Croatia



2. SUMMARY

On 21 June 2018 at 16:00 LT (UTC + 2) m/v "Fidelity" was moored at the berth no 4 of Bršica terminal, in the port basin Raša within Port of Rijeka Authority. The purpose of the arrival was loading of livestock and, besides that, it was planned to load approximately 320 tonnes of Residual Marine Fuel.

The company INA, d.d., as one of the concessionaires for carrying out economic activities of fuel delivery to vessels in the harbour area of Port of Rijeka (except for Omišalj Basin), was chosen to deliver and supply m/v "Fidelity" with Residual Marine Fuel.

The bunkering of m/v "Fidelity" from tank trucks commenced on 21 June 2018 around 23:20 and was conducted by the employees of companies Manšped d.o.o., Gržinčić d.o.o. and Tehno-prom Rijeka d.o.o. When the fuel from the first three tank trucks was loaded on board, the drivers left the port area and, as the next tank truck had not yet arrived, crew members on duty left their positions for bunkering operation leaving the hose connected, fuel manifold valve and Fuel tank no 4 valve open.

When the fourth and the fifth tank truck were delivered at the terminal, fuel suppliers' employees continued bunkering operation without informing vessel's crew members. At the end of loading fuel from the fifth tank truck, the Fuel tank no 4 was overfilled so the fuel was spilt on the deck and into the sea.

As a result of the marine casualty, a pollution of m/v "Fidelity" and serious pollution of the sea and the marine environment of the Bay of Raša by Residual Marine Fuel occurred. Oil pollution also affected the surrounding boats and shellfish farms in the area. There were no fatalities or injuries of crew members, fuel suppliers' employees or other persons.



3. OBJECTIVE INFORMATION (FACTS)

3.1. SHIP PARTICULARS

Name of the vessel:	"Fidelity" (Picture 1)
Former name, year and month of change:	"Regal", 2016, June
Flag and Port of registry:	Lebanese Republic, Beirut
Classification Society:	Croatian Register of Shipping
Call sign:	ODUH
IMO number:	7310507
CRS number:	16070
MMSI:	450511000
Navigation category:	1 – Unlimited navigation
Keel laying date:	12 October 1972
Year and place of built:	1973, Appledore Shipbuilders Ltd, Appledore
Vessel Type:	Livestock carrier
Owner:	Gigi Marine Ltd
Ship operator:	Mary Marine Ltd
Construction particulars:	Single hull
Hull material:	Steel
Minimum manning:	16
Deadweight:	5579 t
Length between perpendiculars:	103.46 m
Length overall:	115.3 m
Breadth:	15.55 m
Depth:	10.65 m
Draught:	6820 mm
Freeboard:	3844 mm
Gross tonnage:	5395
Net tonnage:	2413
Speed:	15.5 kn
Propulsion type:	Internal combustion engine
Type and number of propulsion engines:	Diesel 4-stroke, single acting, 1
Engine manufacturer:	Crossley Premier Engine Pielstick
Licence, type and total power:	Pielstick 12 PC 2 – 2V400, 4413 kW
Place and year built:	–, 1970
Propeller type and number:	1, controllable pitch
Number of side thrusters:	–



Picture 1 Livestock carrier "Fidelity"

(Source: Harbour Master's Office Pula)

3.2. VOYAGE PARTICULARS

Ports of call: on 18 June 2018 m/v "Fidelity" departed from the Port of Al Khums (Libya) towards the Port of Bršica (port basin Raša, Republic of Croatia), where she arrived on 21 June 2018.

Type of voyage: commercial voyage.

Cargo information: loading of livestock on m/v "Fidelity" for the Port of Derince (Kocaeli, Republic of Turkey).

Passengers' information: 2 passengers (Syrian Arab Republic citizens).

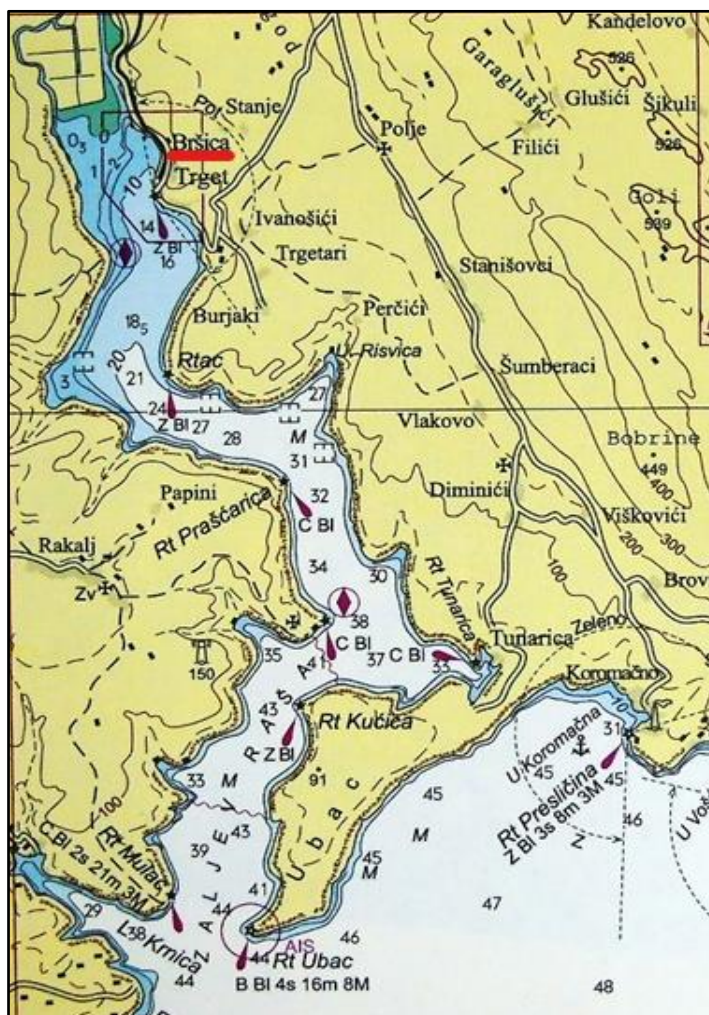
Manning: 30 crew members (Syrian Arab Republic citizens).

3.3. MARINE CASUALTY INFORMATION

Type of marine casualty or incident: very serious marine casualty – serious pollution occurred during the bunkering operation of cargo vessel "Fidelity".

Date and time: 22 June 2018 between 02:55 and 05:37 local time (UTC + 2).

Position of the marine casualty: m/v "Fidelity" was inside the Bay of Raša, starboard side alongside at the berth number 4 of Bršica terminal (Picture 2 and 3). Position: 45° 01' 28" N / 014° 03' 11" E.



Picture 2 Bay of Raša with marked position of the Port of Bršica
(Source: Nautical Chart – Kvarner, Croatian Hydrographic Institute)



Picture 3 Bršica terminal – berth no 4 where m/v "Fidelity" was berthed at the time of the marine casualty

(Source: <https://portal.emsa.europa.eu/SEGServer/>)

External and internal environment: gentle to moderate northeast breeze with speeds of 10 to 15 knots. Calm (rippled) sea (sea state 1) with waves in average height of 0.1 m. Cloudy with rain and afterwards thunderstorm. Air temperature about 21 °C. Good visibility (up to 8 km).

The marine casualty occurred in early morning hours of 22 June 2018 during the astronomical, nautical and civil twilight and shortly after the sunrise at 5:16.

Vessel operation and voyage segment: the vessel was in the loading port where it was planned to load livestock and fuel. During the night from 21 to 22 June, the bunkering operation from the tank trucks into the m/v "Fidelity" was in progress.

Place on board: overflow from the Fuel tank no 4 (port side of the vessel) through the vent (Picture 4) and sounding pipe on the deck, and then over the deck and through the scuppers into the sea.



Picture 4 Marine Residual Fuel on the deck and on the vent of the Fuel tank no 4

(Source: Harbour Master's Office Pula)

Human factors data:

The fuel from the first three tank trucks was loaded on board on 22 June 2018 at 02:05 and the plan was to load the fuel from 3 more tank trucks which at the time haven't arrived at the port. The drivers of the first three tank trucks left the port area, and the crew members on duty left their positions for bunkering operation leaving the hose connected, fuel manifold valve and Fuel tank no 4 valve open. The drivers of the two following tank trucks arrived in the port so they, together with the employee responsible for operating the pump and electric generator, continued the fuel transfer without informing vessel's crew members.

One crew member on duty on the gangway noticed the list of the vessel to the port side and after conducted investigation on board, about 05:15, it was discovered that the Fuel tank no 4 was overfilled and the fuel was spilt on the deck and into the sea. Vessel's crew began with the on board pollution clean-up and prevention of further environment pollution. Around 7:30, the Master of m/v "Fidelity"

attempted to notify competent authorities on the occurred pollution via VHF, but without success, after which he called the company, the agent and P&I club by the phone.

Consequences (for people, vessel, cargo, environment, other):

The marine casualty resulted in pollution of m/v "Fidelity", the sea and environment (Picture 5) and material damage to the owners of surrounding boats (Picture 6) and shellfish breeders. There were no fatalities or injuries of crew members, fuel suppliers' employees or other persons.



Picture 5 Pollution of the sea in Bay of Raša after the marine casualty

(Source: Harbour Master's Office Pula)



Picture 6 Pollution of the sea, coast and boats in the Bay of Raša

(Source: Harbour Master's Office Pula)

3.4. INVOLVEMENT OF COASTAL SERVICES AND READINESS FOR EMERGENCY OPERATION

Participants: County Centre 112, MRCC Rijeka, Harbour Master's Office Pula, Branch of the Harbour Master's Office Pula in Raša, County Operations Centre of Istria County, Public Fire Brigade Labin, Raša Volunteer Fire Department, Metis d.d., employees of the Port of Trget, Adriatic Commercial Diving Ltd, Croatian Coast Guard, Dezinsekcija d.o.o. from Rijeka, Municipalities of Barban and Marčana, inspectors of the Maritime Safety Directorate, Port of Rabac Authority, Municipality of Raša, Zavod za ispitivanje kvalitete d.o.o., Public Health Institute, Ministry of Interior et al.

Means used:

- pollution control vessels
- Croatian Coast Guard vessel OB-03 "Cavtat"
- fire brigade's boat
- crane vessel "Zvonko"
- Dezinsekcija d.o.o. (from Rijeka) vessels
- auxiliary boats < 5 m
- oil absorbent booms



- oil absorbent pads
- waste collection vehicle
- oily water containers
- excavators
- delivery and other vehicles
- electric generator
- submersible pump
- vacuum pumps
- high-pressure pumps
- high-pressure devices for boats cleaning
- crane truck
- skimmers
- vacuum tank truck
- Adriatic Commercial Diving Ltd vessel, etc.

Speed of response and actions taken: According to received information, oil pollution was discovered by crew members on 22 June 2018 at about 5:15 so they initiated the on board pollution clean-up action and prevention of further pollution. About 2 hours and 15 minutes after they had discovered pollution (around 7:30), the Master of the vessel attempted to notify the competent authorities to advise them about the pollution, but without success.

The information about the pollution was reported from another source to the County Centre 112 and MRCC Rijeka at 07:38 and at 07:45 was forwarded to the Harbour Master's Office Pula.

The employees of the Harbour Master's Office Pula and the Branch Office in Raša went to perform a site inspection. Upon arrival, they confirmed the pollution of the sea by fuel extending along the coastline between the Port of Trget and Bršica terminal and visible traces of pollution on the surrounding boats and on the hull plating of the m/v "Fidelity". At 10:30 a decision was made to activate the Intervention Plan in Case of Sudden Sea Pollution in the Istria County. Necessary persons and parties were invited to participate in fighting the pollution of the sea and marine environment and preventing further spread of pollution. Also, measures were taken to determine the material damage to the vessels located in the bay.

At 13:00 started the clean-up action of the sea and marine environment pollution.

Following days, the coordinated action of fighting pollution of the sea and marine environment, carried out pursuant to Intervention Plan in Case of Sudden Sea Pollution in the Istria County, continued with participation of many people and resources, and also cleaning of polluted vessels started.

Results achieved: largely cleaned pollution of the sea, marine environment and third parties' property.



4. DESCRIPTION OF EVENTS (RECONSTRUCTION OF MARINE CASUALTY)

Thursday, 21 June 2018

Cargo vessel "Fidelity" had departed from the Port of Al Khums (Libya) towards the Bay of Raša where on 21 June 2018 at 9:30 local time (UTC + 2) was anchored at the outer anchorage. On the same day, at 16:00 the vessel was berthed with starboard side alongside at the berth number 4 of Bršica terminal for the purpose of loading cargo (livestock) and approximately 320 tonnes of Residual Marine Fuel, type F RME 180. After completion, the vessel was supposed to depart towards discharging Port of Derince, Kocaeli (Republic of Turkey).

The company INA, d.d., as one of the concessionaires for carrying out economic activities of fuel delivery to vessels at the harbour area of the Port of Rijeka, except for Omišalj Basin, was chosen to deliver Residual Marine Fuel and supply m/v "Fidelity".

According to the agreement between the agent and the employees of the company INA, d.d., Residual Marine Fuel should have been loaded on board from 12 tank trucks by portable pump and electric generator. Among them, fuel from 6 tank trucks should have been delivered on 21 June 2018 between 21:00 and 07:00 and fuel from other 6 tank trucks at the same time frame on 22 June 2018.

On 21 June 2018 at 19:10, a truck delivering hay for the m/v "Fidelity" arrived at the port area and the hay was stowed on the terminal in front of the vessel.

The first tank truck was delivered in the harbour area at 21:24, and soon after one more tank truck. The fuel was transported by the employees of companies Gržinčić d.o.o. and Tehno-prom Rijeka d.o.o. The drivers were informed to wait for the employee of company Manšped d.o.o. who had delivered the pump with one van and went to pick up the electric generator. He delivered electric generator with another van and remained at the terminal during the entire bunkering operation and operating the pump and electric generator.

Upon their arrival, the crew of m/v "Fidelity" carried out the final preparatory works for upcoming bunkering operation. Therefore, the Chief Engineer completed and signed the Bunker Operation Checklist.

At around 23:00, one more tank truck was delivered at the terminal in front of the m/v "Fidelity".

At 23:05, crew members took one end of the hose and connected it to the vessel's manifold. Around 23:20, bunkering operation from the first tank truck started.



During the bunkering operation, the Chief Engineer was with the Third Engineer on the starboard side bunker station where they were, according to their statements, sounding the starboard side fuel tanks and calculating the quantity of loaded fuel, and the Second Engineer was with the Oiler sounding the port side fuel tanks so they mutually communicated over a portable radio station on channel 06. Bunkering from the first tank truck was completed around midnight and the documents were then verified so the driver drove the tank truck out of the port area.

Friday, 22 June 2018

After midnight, the driver of the second tank truck parked the vehicle on the position for bunkering operation and by the hand gesture asked two crew members on the deck if he can connect the hose on the tank truck. One crew member replied also with the hand gesture (thumb up) that he may connect the hose. After connection, driver opened the valve on the tank truck, the pump was started and the fuel transfer from the second tank truck commenced. The operation was completed around 01:00. According to the driver's statement, after the fuel transfer commenced he took required documentation and brought it on board where it was verified.

Immediately after, the third tank truck was connected and the bunkering started around 01:10. Around 1:45, crew members noticed the list of the vessel to the port side. The list was corrected by opening the valve connecting Fuel tank no 4 with no 5 on the opposite side of the vessel. At 02:05, the bunkering from the third tank truck was completed and the valve connecting the Fuel tank no 4 and 5 was closed. Tank truck driver went on board to verify his documents and shortly stayed on board because the crew members were interested when the rest of tank trucks is going to arrive. According to his statement, he said that the rest of the tank trucks is going to arrive soon in order to complete the planned job and that he is going to be the driver of one of them. Then he headed towards Rijeka.

According to the Chief Engineer's statement, he was informed by the driver that the next tank truck will arrive in about 3 hours. Therefore, the crew members left their designated places for bunkering operation leaving the hose connected, vessel's fuel manifold valve and Fuel tank no 4 valve open. The regular duties were then carried out by the Able Seaman on the vessel's gangway, the Second Officer on the bridge and the Third Engineer and the Oiler in the engine room.

The Second Engineer and the Chief Engineer went to rest in their cabins. According to the statement of the Chief Engineer, he requested from the Third Engineer to notify him when the next tank truck arrives. The Third Engineer stated that he then went to the engine room to perform his regular duties and that the Chief Engineer was responsible for further bunkering operations, but that he didn't know where the Chief Engineer went after bunkering from the third tank truck was completed.

The fourth tank truck was delivered around 02:55 and the fuel suppliers' employees continued bunkering without informing crew members about it. They completed the fuel transfer around 03:54.



Fourth tank truck driver went on board to verify his documents but he stated that he ran into the one crew member who told him that the Master is sleeping and that he wakes up around 08:30. He then got off the vessel and went into the truck with an intention to sleep until the morning.

According to the statement of the Master, the crew member on duty on the gangway around 04:00 noticed the list of the vessel to the port side whereof he informed the Master, and then the Master together with the Chief Officer, started sounding the water level in the tanks on the starboard side of the vessel because he assumed that the list was caused due to lack of water in large topside tanks which can have a significant impact on the vessel's stability. He also stated that the fodder and hay stowed on the terminal blocked the view from the deck towards the tank trucks.

At 4:23, the fifth tank truck was delivered at the terminal and the fuel suppliers' employees commenced with bunkering of the m/v "Fidelity", again without informing crew members about it.

Master stated that around 05:00 they completed sounding water level in the tanks on the starboard side of the vessel and began sounding the tanks on the port side. Around 5:15 they came to the vent of Fuel tank no 4 and noticed that the fuel had spilt through the vent on the deck and into the sea. Master stated that he gave order to the Chief Officer to call the Second Officer and raise the general alarm. Crew members then commenced with the action of cleaning and preventing further pollution from the vessel.

From the official note composed in the Police station Labin after insight into Port of Bršica surveillance camera's video record arises that the fifth tank truck moved from the designated bunkering place at 05:37.

Master of the vessel "Prince Joy" moored southern of the vessel "Fidelity" woke up due to severe storm and went to close the side scuttle, but thereat felt strong smell of fuel oil. He then called the Chief Engineer who confirmed that everything was in order with their vessel. From the bridge he noticed the oil on the sea surface from the north-eastern direction. He tried to contact VTS Rijeka, but without success. He also didn't manage to contact the vessel "Fidelity" and therefore he assumed that there was no signal. He decided to leave a message to the agent to notify the competent authorities about the pollution. He stated that all of that was happening around 5:50. He monitored further development of the situation and he noticed that around 7:00 the pollution stopped and he noticed white powder in the sea.

Around 7:30 the Master of m/v "Fidelity" attempted to notify the authorities about pollution via VHF, but unsuccessfully. Around 07:35 he notified the company, agent and P&I club by telephone.

County Centre 112 at 7:38 from another source received the notification on pollution of the sea by hydrocarbons in the Bay of Raša. MRCC Rijeka was notified and at 07:45 the notification was forwarded

to the employees of the Harbour Master's Office Pula so they immediately informed the Branch of Harbour Master's Office Pula in Raša and the navigation safety inspector on duty.

According to the statements of the fourth and fifth tank truck drivers, around 08:00 they went on board where their documents were verified but they had no knowledge of the pollution, nor did any of the crew members mentioned the occurrence of the disastrous event.

The employees of the Harbour Master's Office Pula and Branch Office in Raša on the field confirmed the pollution of the sea and marine environment by the hydrocarbons which extends from the Port of Trget and the Bršica terminal, and the traces of fuel on the surrounding boats. Also, they noticed traces of fuel oil on the port side of the hull plating and below the scuppers (bottom ends) on the m/v "Fidelity" (Picture 7).



Picture 7 Traces of fuel below the scupper on hull plating of the m/v "Fidelity"
(Source: Harbour Master's Office Pula)

At 10:30, the chief of the County Operations Centre issued a decision to activate the Intervention Plan in Case of Sudden Sea Pollution in the Istria County. COC and Dezinsekcija d.o.o. members were invited



to participate in fighting the pollution of the sea and to install floating booms for which the Croatian Coast Guard approved assistance of their vessel.

At 11:40 in the Bay of Raša was temporarily suspended maritime traffic while the Port Authority Rabac and the Municipality Raša were creating a list of vessels located in the bay in order to determine material damage. Inspectors of the harbour master's offices headed towards the m/v "Fidelity" to conduct the inspection.

At 13:00 the clean-up action of the polluted sea and marine environment started and at 14:50 the Public Health Institute began sampling of the sea at the beaches.

Citizens reported to the County Centre 112 the spread of pollution to the Blaz and Salamušćica coves, which was subsequently confirmed by the employees of the Branch of Harbour Master's Office Pula in Raša.

At 19:00 Zavod za ispitivanje kvalitete d.o.o. (ZIK) started with sampling of hydrocarbons from the vessel's fuel tanks and from the sea surface to determine with certainty that the pollution source had been from m/v "Fidelity", i.e. from Fuel tanks no 4 and 5. By their analysis it was concluded that the samples were very similar and that it could be with great probability assumed that the fuel in the sea originated from the Fuel tanks no 4 and 5 of the m/v "Fidelity".

At 20:00 the clean-up pollution action was temporarily suspended.

At 21:00 the inspection of m/v "Fidelity" was completed and the Master received detention because of the defects that directly affect safety, health or the environment.

On the same day the Master of m/v "Fidelity" wrote a protest letter denying the responsibility of his vessel, shipowner and ship operator for the damage and losses incurred to the property and the environment. He argued that the last tank truck arrived one hour later than the previous, connected the hose without any notice to the crew and without signing any papers on board, started pumping the fuel and that it was not possible to see tank truck from the vessel due to fodder and hay.

Saturday, 23 June 2018

The coordinated clean-up pollution action of the sea continued at 08:00. Additional number of people was engaged in collecting seagrass ejected on the coast during the low tide which has absorbed portion of pollutants.



Simultaneously, Dezinsekcija d.o.o. continued to collect the pollutants into the tanks by vacuum pumps and by their boat was noticed the pollution between the Blaz cove and the Škrila cape and inside the Rišvica cove.

In cooperation with the Municipalities of Barban and Marčana, additional number of people and resources have been engaged with the aim of intensified cleaning of beaches in the Blaz cove. At the mouth of the Raša River an oil absorbent boom and additional booms in the Blaz cove and the Port of Trget were installed.

At 19:00 the temporary suspension of maritime traffic in Bay of Raša was abolished, while at 20:00 the clean-up pollution action was temporarily suspended.

Upcoming days

During the following weeks, the coordinated action of fighting pollution of the sea (carried out pursuant to Intervention Plan in Case of Sudden Sea Pollution in the Istria County) continued.

On 24 June 2018, washing of local population boats contaminated by hydrocarbons commenced.

M/v "Fidelity" was on 27 June 2018 moved from the berth and anchored at the inner anchorage.

On 28 June 2018, second inspection survey of the m/v "Fidelity" was conducted where the vessel was released from the detention due to defects that directly affect safety, health or the environment. However, at the same time the vessel received an arrest order banning the m/v "Fidelity" to depart from the Port of Raša until settling the costs of removing harmful substances from the marine domain and other damage caused by fuel spill or until an adequate guarantee for covering damage is provided.

Another inspection of the vessel pursuant to ISM Code was carried out on 30 June 2018, where two observations, seven non-conformities and two major non-conformities were established.

On 16 August 2018 a decision was made to abolish the order banning the m/v "Fidelity" to depart from the Port of Raša. It was explained that on 2 August 2018 the insurer Lodestar Marine Limited (London) signed the Letter of undertaking and on the same day the authorization of the insurer's company was given. On 6 August 2018 the Side Agreement was signed by insurer's plenipotentiary, Istria County and the Ministry of Sea, Transport and Infrastructure. Through those documents it was established that costs of clean-up action of polluting goods from maritime demesne and other damages caused by pollution were partly settled and the appropriate guarantee was given for settling other costs of cleaning and other damages caused by pollution up to the liability coverage limit of the ship operator.



5. ANALYSIS

5.1. HUMAN FACTOR

Persons directly involved in the bunkering operation of m/v "Fidelity" were crew members of m/v "Fidelity" and fuel suppliers' employees.

5.1.1. Crew members of m/v "Fidelity"

5.1.1.1. Structure of crew members on board m/v "Fidelity"

According to the IMO Crew list, at the time of the marine casualty, thirty (30) crew members were on board m/v "Fidelity", all of them Syrian Arab Republic citizens:

- Master
- Chief Officer
- Second Officer
- Chief Engineer
- Second Engineer
- Third Engineer 1
- Third Engineer 2
- Electrician
- Fitter
- Boatswain
- Able Seaman 1
- Able Seaman 2
- Able Seaman 3
- Able Seaman 4
- Able Seaman 5
- Able Seaman 6
- Ordinary Seaman 1
- Ordinary Seaman 2
- Ordinary Seaman 3
- Ordinary Seaman 4
- Ordinary Seaman 5
- Ordinary Seaman 6
- Oiler 1
- Oiler 2
- Oiler 3
- Wiper 1



- Wiper 2
- Chief Cook
- Mess Boy 1
- Mess Boy 2.

On board were also two (2) passengers among which a two-year old child.

On behalf of the competent ministry of the Lebanese Republic, m/v "Fidelity" obtained Minimum Safe Manning Certificate in accordance with the International Convention for the Safety of Life at Sea (SOLAS Convention), 1974, as amended, Chapter V, Rule 14/2. In accordance with the aforementioned Certificate, the m/v "Fidelity" was considered safe for navigation if the number of crew members was not less than 16:

- Master (1)
- Chief Officer (1)
- Navigational Officer (1)
- Able Seaman (4)
- Ordinary Seaman (1)
- Chief Engineer (1)
- Second Engineer (1)
- Engineering Officer (1)
- Oiler (3)
- Other Engine Room Rating (1)
- Chief Cook (1).

By inspecting the crew members' certificates it was found that they possessed valid and required certificates of competency, therefore the composition and number of the crew on board m/v "Fidelity" complied with the requirements of the Minimum Safe Manning Certificate.

According to the crew members' statements, during the bunkering from the first three tank trucks, the following persons were involved in the operation: Chief Engineer, Second Engineer, and Third Engineer and Oiler which were relieved at midnight with other Third engineer and Oiler. When the bunkering from the third tank truck was completed, and because of the Chief Engineer's statement that he received an information from the driver that the break of about 3 hours will appear, the Chief Engineer and the Second Engineer went to rest expecting that they will be informed upon arrival of the next tank truck. Third Engineer was together with the Chief Engineer at the time when supposed information was received so he stated that, listening to the conversation between the Chief Engineer and the driver, he understood that the next tank truck will arrive in 4 hours (at 06:00 when his watch is ending).

According to the crew members' statements, at the time of the marine casualty, crew members on duty were: Third Engineer and Oiler performing their regular duties in the engine room, Second Officer on the bridge correcting the navigational charts and Able Seaman on the gangway.

According to the Able Seaman's statement, he was the only crew member on duty on the deck. His view from the gangway to the place where the tank trucks were located was obstructed by the cattle ramp (Picture 8), hay and fodder stowed at the terminal, and he was not allowed to leave his place of duty. Also, it can be assumed that the rain and then heavy rain with thunder had a negative impact on his ability to observe by sight and hearing the actions happening around the vessel.



Picture 8 Obstructed view from the gangway towards the place where the tank trucks were located (below and beside the port crane)

(Source: AIA)

According to the vessel's Table of Shipboard Working Arrangements, at the time of the marine casualty on duty should have been two more Ordinary Seamen and one Wiper. Also, according to the company's procedure Bunkering Operation, two Able Seaman should have been assigned to monitor and control the condition of the vessel's mooring equipment, as well as the early detection and reporting of oil spills into the sea, and no one has been assigned for mentioned duties on board m/v "Fidelity".

Besides that, during the stay in the Port of Bršica crew members of m/v "Fidelity" were obliged to act in accordance with the security level 1. In Article 20 Paragraph 4 and Subparagraph 5 and 6 of the Act on Maritime Ship and Port Security (Official Gazette no 108/17) and 7.2.5 and 7.2.6 of ISPS Code (part



A) it is regulated that the Master and crew members must pay particular attention to monitoring of deck areas and areas surrounding the ship and supervising the handling of ships stores. Late detection of arrival of the fourth and fifth tank trucks, the continuation of bunkering operation, the list of the vessel and finally spillage of the fuel from the tank no 4 on the deck and into the sea indicates that the Master and the crew did not comply with mentioned requirements.

According to received information, none of the m/v "Fidelity" crew members appeared at the bunkering station after 3 hours expected for the arrival of the next tank truck (from Chief Engineer's statement) nor even occasionally checked if everything is in order.

According to received information and the Port Security Guards' log, it is established that at the time of the marine casualty all crew members and passengers were on board, and that no other persons except crew members and passengers were on board. There is no information that would indicate to the conclusion that other crew members or passengers affected the key persons who performed or should have been performing their duties on a day and at the time of the marine casualty.

There are no facts pointing to mental problems of the crew members, weakened health, impaired health due to malnutrition, inability to work, conflicts with other people, nor that there were actions on board that would distract the crew members from their duties or trigger them to consciously make inappropriate actions.

5.1.1.2. Events, actions and omissions of the crew members of m/v "Fidelity"

Upon arrival of the first two tank trucks, pump and electric generator, the crew of m/v "Fidelity" started with the final preparatory works for bunkering operation. The Chief Engineer completed the Bunker Operation Checklist whose use is regulated by the company procedures. Through this checklist, among other things, he confirmed that all scuppers were plugged, that the BRAVO flag (a red flag showing that the vessel is loading, discharging or carrying dangerous goods) was raised from the sunrise to the sunset, and otherwise one all-round red light was exhibited, that sufficient SOPEP equipment was ready close to the intended operation, that effective means of communication were established on channel 06 and agreed with the bridge and the terminal and that the emergency shut down procedures were agreed with the terminal. During the vessel's inspection it was found that these actions were not carried out. In addition, according to the instructions of the Bunkering Operation procedure, this checklist was required to be completed and signed by the Second Engineer and handed over to the Chief Engineer for approval. In this case it was signed and completed only by the Chief Engineer who stated that this was a routine job for him.

Although in the checklist it was stated differently, communication with portable radio station on channel 06 was established only between the Chief Engineer and the Second Engineer who was sounding fuel tanks on the opposite side of the vessel. According to the statement of the crew member involved in bunkering operation, the Chief Engineer was communicating with fuel suppliers' employees



verbally without any means of communication (it is assumed that this relates only to the communication with the Sales Manager who was on the terminal before the start of bunkering operation because the Sales Manager stated that he then talked in English with one unknown person on board) while fuel suppliers' employees stated that for the purpose of later hose connections and start of each tank truck fuel transfer they communicated by gestures.

Gestures and verbal communication without any means of communication between the vessel and the terminal in the night conditions, in surroundings where the view from the vessel to the terminal was limited due to obstacles (as the Master stated after the marine casualty), and considering issued meteorological warnings about the upcoming thunderstorm cannot be considered as established effective means of communication. Besides that, ignorance of English language by the employee responsible for operating the pump and electric generator who participated in entire bunkering operation and therefore had to communicate and cooperate with both sides to ensure coordinated bunkering operation, misunderstandings about the time of arrival of following tank trucks, and also continuation of bunkering operation without informing responsible crew members show the impact of the ineffective communication on the course and outcome of marine casualty.

Furthermore, ineffective internal communication between the crew members of m/v "Fidelity" is proven by the statement of the fourth tank truck driver who after completion of fuel transfer (around 04:00) went on board trying to find the Master to verify his documents but one crew member (the assumption is that it is Able Seaman on duty on the gangway) told him that the Master is sleeping, statement of the Able Seaman that he saw 4 or 5 tank trucks but he didn't know if they were full or empty and that the bunkering operation is not his responsibility, and the fact that considering everything mentioned he noticed the list of the vessel and called the Master to notify him only about the list and that the Master went to sound the water tanks without first checking with Chief Engineer if everything is in order with the bunkering operation.

Upon departure of the third tank truck, crew members involved in bunkering operation left their designated places for bunkering operation thinking that the next tank truck will arrive in about 3 hours and left the hose connected, fuel manifold valve and Fuel tank no 4 valve open and without any supervision. That action enabled the continuation of the bunkering operation by the fuel suppliers' employees without informing crew members about it. In case the manifold valve was closed, in order to continue the bunkering operation fuel suppliers' employees would have had to walk to the gangway (because they didn't have any other means of communication established with the crew members), ask the watchman for the assistance of the crew members and wait until the assistance is provided.

When the Master and Chief Officer found out about the pollution, according to their statements they alerted the Second Officer to announce the general alarm, which (according to his statement) he did around 5:20. In case of general alarm announcement, crew members immediately have to proceed to the Master station and wait for further instructions. Despite the above mentioned, the Able Seaman on duty on the gangway stated that he found out about the pollution only when he saw all crew



members sprinkling material on the deck to absorb the fuel that had spilt, and the Third Engineer on duty in the engine room stated that he received information from the mentioned Able Seaman while the Chief Engineer stated that he was notified about the pollution from the Third Engineer around 5:30. These statements indicate to the conclusion that the general alarm was not even announced. Same can be confirmed by reviewing the Port Security Guards' log whose position was nearby the m/v "Fidelity" and from where it is possible to hear vessel's general alarm, but at the end of their shift, at 07:00 was written that there were no problems experienced during the shift, and in their statement was said that they found out about the pollution only at 08:50.

From the official note composed in the Police station Labin after insight into Port of Bršica surveillance camera's video record arises that the fifth tank truck moved from the designated bunkering place at 05:37, and that the crew members were seen on the gangway for the first time after the marine casualty at 06:59 and on the bunkering station at 07:15. The Master stated that about 05:30 he ran towards the fifth tank truck to stop the bunkering operation but there he saw that all the fuel was already unloaded, hose disconnected from the tank truck and that the tank truck driver was sleeping in his cabin. Considering the video record, the Master's statement regarding the times of his actions cannot be taken into account.

Besides that, the ship's agent stated that around 06:30 in the morning he received video records from the Master of other vessel in the same port showing that some liquid is leaking into the sea from m/v "Fidelity". He claims that he called the Master of m/v "Fidelity" who told him that there is no liquid leaking from his vessel. From everything previously stated arises the conclusion that, when the Master found out about the pollution, he tried to hide it and as much as possible clean the pollution.

Only about 2 hours and 15 minutes after crew members discovered the oil pollution, i.e. around 07:30 the Master attempted to notify the authorities about the casualty via VHF, even though according to the Article 49.f of the Maritime Code (as amended) the Master of a marine facility that polluted the sea, the air or the coast or notices pollution is obliged to notify the Ministry without delay.

5.1.2. Fuel suppliers' employees

5.1.2.1. Fuel suppliers' employees involved in delivery of fuel and bunkering of m/v "Fidelity"

In bunkering operation of m/v "Fidelity" during which the casualty occurred was involved 5 tank truck drivers, three of whom were employed by the company Gržinčić d.o.o., and two by the company Tehno-prom Rijeka d.o.o. One employee of the company Manšped d.o.o. brought and operated the pump and electric generator and participated in bunkering from all tank trucks. Sales Manager was, according to the received information, on the terminal a short period of time before the start of bunkering operation.



The delivery of fuel and bunkering of m/v "Fidelity", according to the Declaration of Dangerous or Polluting Goods which before handling with mentioned goods has to be submitted for approval to the port authority, should have been done by 3 tank truck drivers (2 drivers of the company Gržinčić d.o.o. and 1 of the company Tehno-prom Rijeka d.o.o.), i.e. each driver was supposed to transport two tank trucks per night. During the first night of bunkering operation of the m/v "Fidelity", first 3 tank trucks were driven by the drivers stated in the Declaration, fourth tank truck was driven by employee of company Gržinčić d.o.o. who wasn't stated in the Declaration, and fifth tank truck was supposed to be driven by the driver of the first tank truck but in the meantime his working hours ended so he loaded the tank truck in the Rijeka Oil Refinery and about 03:00 the owner of the company Tehno-prom Rijeka d.o.o. (also not stated in the Declaration) took over the tank truck on the rest area Vrata Jadrana and drove it to the Port of Bršica. After the marine casualty, the owner of the company Tehno-prom Rijeka d.o.o stated that this was his first experience of bunkering the vessel.

From the company INA, d.d. arises that the Sales Manager of company Manšped d.o.o. on 24 July 2018 stated that the sixth tank truck (which was supposed to deliver fuel on the same night) didn't arrive because they had some problems with entry into the Rijeka Oil Refinery so the tank truck was loaded around 08:00 and departed towards the Port of Bršica but at 10:00 they stopped the tank truck before arrival in the Port of Bršica. It is not known why the sixth tank truck was directed towards the port after 08:00 if bunkering operation had to be completed until 07:00, and was stopped at 10:00 while the employee responsible for operating the pump and electric generator stated that at 08:00 he was informed from the Sales Manager that further bunkering operation is postponed and that he may leave the port.

From the drivers' certificates of competence it is determined that all drivers involved in the bunkering operation of m/v "Fidelity" were in possession of valid ADR certificate issued in accordance with the Ordinance on Professional Training of Drivers for Vehicles Carrying Dangerous Goods by Road (Official Gazette no 96/09, 96/13).

Through the informative conversation held in the Police station Labin with fuel supplier's Sales Manager and other involved employees it was established that on the question about ordinances which they have to follow during the bunkering operation of vessels, the persons who were asked about it (Sales Manager and employee responsible for operating the pump and electric generator) did not know the answer to that question or they claimed that such thing doesn't exist. Above mentioned points to the fact that they were not familiar with the positive provisions of the Republic of Croatia on protection, in particular fire protection, occupational safety, the protection of the natural and working environment and those regulations related to the order in port, handling of hazardous and pollutant substances and as well those directly or indirectly related to the performance of the relevant activity including the internal procedures.



There are no facts pointing to mental problems of the fuel suppliers' employees, weakened health, inability to work, conflicts with other people, nor that there were actions that would distract the employees from their duties or trigger them to consciously make inappropriate actions.

5.1.2.2. Events, actions and omissions of fuel supplier's employees

On 21 June 2018, from 20:30 to 23:00 in port area were delivered 3 tank trucks and 2 vans, one with pump and another with electric generator. According to received information, the Sales Manager of company Manšped d.o.o. was on the terminal before commencement of the bunkering operation and he talked in English with one crew member about the upcoming bunkering operation. Besides him, it is also known that the third tank truck driver, after the completion of the fuel transfer of third tank truck, verbally communicated with crew members of m/v "Fidelity" so it can be assumed that he was the one who told crew members the supposed information that the next tank truck will arrive in about 3 hours.

From company INA, d.d. arises that the driver of the third tank truck on 3 August 2018 stated that he, after he completed bunkering, shortly stayed on board engaged in conversation with crew members because they were interested when the rest of tank trucks is going to arrive. He then stated that he told them that the rest of the tank trucks is going to arrive soon in order to complete the planned job and that he is going to be the driver of one of them. This also confirms that the problems in communication between crew members and fuel suppliers' employees affected the course and outcome of the marine casualty.

It is worth mentioning that the employee responsible for operating the pump and electric generator on 29 June 2018 in the Police station Labin stated that before he left the port one crew member on the deck didn't want to disconnect the hose and since he doesn't speak English, he asked one employee working on the transfer of livestock to help him to communicate with mentioned crew member. Taking into account the fact that the employee responsible for operating the pump and electric generator doesn't speak English and that he was performing a task where he was representing an important link connecting crew members with tank truck drivers so he had to communicate and cooperate with both sides to ensure safe operation, it can be considered that in that field he was not competent for the job he was doing.

Fuel suppliers' employees had to, among other things, comply with the provisions of Article 112 Paragraph 7 of the Ordinance on Handling of Hazardous Substances, the Conditions and Manner of Transport in Maritime Traffic, Loading and Unloading of Hazardous Substances, Bulk and Other Cargo in Ports and the Manner for Preventing the Spreading of Oil Spills in Ports (Official Gazette no 51/05, 127/10, 34/13, 88/13, 79/15, 53/16, 41/17) as follows:

- *if a vessel is performing bunkering operation from a vehicle, the Master or authorized officer on board and the person operating a vehicle for supply of vessel with fuel, are obliged to take all*



prescribed fire protection measures as well as measures to prevent pollution of the environment.

On the harbour area of the Port of Rijeka Authority it is a common practice to use the Bunkering Checklist. By this checklist, the responsible person of the fuel supplier together with the responsible person on board had to, before commencement of the bunkering operation, agree about safety details of the operation and carry out the Bunkering Checklist. By this checklist, both sides, among other things, had to confirm:

- that they accept the area for the bunkering operation, taking into account weather conditions, weather forecast, maritime and land traffic and safety conditions
- that efficient ship and supplier watch is established
- that efficient communication system is established between the ship and supplier, and on board
- that emergency signals and shutdown procedures have been agreed
- that persons in charge for supervision of the bunkering operation and emergency shut down at all times are nominated by ship and supplier
- that all regulations for safety and pollution prevention are checked and satisfied.

By this checklist, both sides involved had to accept the area for bunkering operation taking into account weather forecast, meaning that they accepted the operation regardless the warning on the thunderstorm with gusts of north-easterly wind (more detailed in 5.5.2.2. Weather Conditions). By the analysis of weather conditions it is established that the rain started during bunkering from the fifth tank truck and gradually started to intensify which is also confirmed by the statement of the Master of the vessel moored southern of the m/v "Fidelity" who was around the time of the marine casualty waken up by the thunderstorm.

By the Article 6 of the Ordinance that Specifies Special Safety, Protection and Other Measures for Handling Hazardous Substances in the Port Area Operated by the Port of Rijeka Authority (2005.) it is regulated:

- *the concessionaire and/or any other person handling hazardous substances in the port area shall suspend his work, if adequate safeguards have not been taken in respect of the type of dangerous substances handled, means of operation and meteorological conditions during that work.*

According to previous stated, it can be concluded that unfavourable weather conditions were timely forecasted and after their appearance inappropriate for performing this type of operation, so it can be assumed that the bunkering operation of m/v "Fidelity" at the time of appearance of inappropriate weather conditions should have been suspended for safety reasons.

In the Bunkering Checklist it is stated that all regulations for safety and pollution prevention have to be checked and satisfied but in previous section (5.1.2.1. Fuel suppliers' employees involved in delivery of



fuel and bunkering of m/v "Fidelity") it was established that some fuel suppliers' employees did not even know about the existence of binding ordinances so they weren't able to check their regulations and satisfy them. Also, according to available information it is established that emergency signals and shutdown procedures have not been agreed as foreseen by the checklist.

Other requirements from the Bunkering Checklist emphasize the importance of inclusion, supervision and coordination of bunkering operation from both involved sides. Fuel suppliers' employees continued bunkering from the fourth and fifth tank truck without informing crew members, whereby crew members lost the opportunity to participate in the continuation of bunkering operation for which they were responsible. Finally, it can be concluded that fuel suppliers' employees did not take all measures to prevent pollution of the environment.

5.2. CARGO VESSEL "FIDELITY"

By the inspection of cargo vessel flying the Lebanese flag "Fidelity" it was concluded that the vessel at the time of the marine casualty possessed all valid certificates.

By reviewing the certificates and records in the Status List of Surveys and Observations of CRS, it was established that the vessel was regularly surveyed in accordance with deadlines and planned survey intervals and that no observations were established in the Status List.

The vessel obtained the Certificate of Class on 25 April 2014 which was expiring on 30 November 2018. Last annual survey (of the hull and machinery) was carried out on 10 September 2017.

In the Table 1 are issue and expiry dates of other relevant certificates for this specific case.

Table 1 Relevant ship's certificates, dates of issue and expiry

Certificate	Date of issue	Date of expiry
International Oil Pollution Prevention Certificate	19 August 2016	30 August 2018
Certificate of Insurance or Other Financial Security in Respect of Civil Liability for Bunker Oil Pollution Damage	28 October 2017	28 October 2018
International Ship Security Certificate	7 October 2016	1 June 2021

(Source: AIA)

From the last survey, there have not been reported or revealed facts that would indicate to the vessel's technical malfunction or the failure of some of the critical equipment.



5.3. EVENTS THAT INVOLVE HAZARDOUS SUBSTANCES

Prior to arrival of m/v "Fidelity" in the Port of Bršica, crew members declared and in the CIMIS information system was reported that on board the vessel remained:

- 99.7 tonnes of residual fuel
- 79.7 tonnes of diesel fuel
- 16590 liters of lubricant.

There was a plan to load approximately 320 tonnes of Residual Marine Fuel type F RME 180, UN number 3082, with technical name environmentally hazardous substances, liquids, N.O.I. From the Safety Data Sheet¹ for Residual Marine Fuels, issued by the company INA, d.d., it arises that this fuel is harmful and may cause cancer if inhaled, that it can cause damage to organs through prolonged or repeated exposure and that is recommended to seek medical attention after exposure. Besides that, it is very toxic to aquatic life with long lasting effects.

Until discovery of the marine casualty, on board was loaded fuel from five tank trucks. From the documentation, the amount of fuel loaded on board from each tank truck was:

- 1. tank truck – 24900 kg
- 2. tank truck – 24920 kg
- 3. tank truck – 25760 kg
- 4. tank truck – 24380 kg
- 5. tank truck – 24980 kg

Total amount of Marine Residual Fuel loaded on board after the fifth tank truck should have been 124940 kg. Including the remaining 99.7 tonnes of residual fuel which crew declared that was on board upon arrival, it turns out that on board should have been total of 224.64 tonnes of Residual Marine Fuel. During the inspection it was established that on board m/v "Fidelity" after the marine casualty was 221.7 tonnes of Marine Residual Fuel. The difference between the calculated and measured amount of fuel is 2.94 tonnes.

During the third inspection of the m/v "Fidelity", the Chief Engineer stated that after loading the third tank truck, 34 tonnes of fuel were in the Fuel tank no 4. Since the total tank capacity is 76.6 tonnes, it can be concluded that further 42.6 tonnes of fuel could have been loaded into the tank. After that, total of 49.36 tonnes of fuel was loaded on board from the fourth and fifth tank trucks. By this calculation, Fuel tank no 4 was overfilled by 6.76 tonnes of fuel.

During assessment of the amount of fuel spilt into the sea, the possibility of initial data error, deviations in measurements and calculations, and the fact that some amount of fuel had remained on the vessel

¹ INA, d.d.: "Safety Data Sheet", Residual Marine Fuels, 28.2.2017, https://www.ina.hr/wp-content/uploads/2020/01/Brodaska_goriva_ostatna_izdanje_5_EN.pdf



were also taken into consideration, so according to all mentioned it can be assumed that as the outcome of this marine casualty between 3 and 5 tonnes of marine residual fuel have been spilt into the sea.

5.4. EXTERNAL INFLUENCES

According to the Port Security Guards' log, in the night from 21 to 22 June 2018 at the Port of Bršica were berthed vessels "Prince Joy" and "Fidelity" at the wood terminal, and "Phoenix I" at the livestock terminal. "Phoenix I" departed from the berth at 23:00 and the vessel "Karim Allah" berthed at the livestock terminal at 00:35.

There were no reported or revealed facts indicating to an assumption or conclusion that during the time of the casualty other external influences, positive or negative (proximity or actions/omissions of other vessels or persons, alarms, port staff influence, cargo loading or other similar influences) affected the course and outcome of the marine casualty.

5.5. ENVIRONMENT

5.5.1. Internal environment

There were no reported or revealed facts that would indicate to an assumption or conclusion that impacts of internal environment in vessel or vehicles (temperature, ventilation, lighting, noise, vibration, etc.) had an influence on the course and outcome of the marine casualty.

5.5.2. External environment

5.5.2.1. Characteristics of the port basin Raša

Bay of Raša is located on the eastern coast of the Istrian peninsula, southwest of the City of Labin. At the bottom of the bay lies the mouth of the Raša River. Bay of Raša is about 6.5 nautical miles long and the average width is about 0.5 nautical miles.

Port basin Raša is located on the north-eastern coast of the Bay of Raša, close to the mouth of the Raša River. Apart from the maritime traffic, it is connected with the railway and the road.

Port basin Raša is under management of the Port of Rijeka Authority. It consists of two specialized terminals, Štalije and Bršica, which stretch together from the mouth of the Raša River to Trget cape.



The Bršica terminal was originally built for unloading of coal, and today it has options for transshipment of general cargo and wood together with infrastructure and equipment for receiving and dispatching of up to 1000 heads of large livestock. The sea depth at the Bršica terminal is about 9 meters, but the depths in the Bay of Raša are subject to change due to possible inflows of the Raša River.

There are no reported or revealed facts pointing to the assumption or conclusion that the course and outcome of the marine casualty was affected by technical, technological or other features of the terminal Bršica.

5.5.2.2. Weather conditions

According to the meteorological report of the Croatian Meteorological and Hydrological Service – Marine Meteorological Service – Marine Meteorological Center Split, a warning issued on 21 June 2018 at 12:00 was as follows:

- in the afternoon somewhere along the coast light thunderstorm. During the second part of the night and morning in the north and part of the middle Adriatic somewhere thunderstorms. In the morning on the northern Adriatic, gusts of north-easterly wind of 35 – 45 knots.

Besides that, the weather forecast for the following 24 hours in the Adriatic area was issued as follows:

- slight to moderate cloudy, in the afternoon somewhere along the coast variable cloud cover together with thunderstorm, while in the second part of the night and the morning in north and the part of the middle Adriatic is expected more clouds with rain and heavy rain with thunder.

From the Harbour Master's Office Pula were received notes with information about meteorological conditions on the position of marine casualty: gentle to moderate northeast breeze with speeds of 10 – 15 knots, calm sea (sea level 1 according to Douglas scale) with waves of 0.1 m average height, good visibility (up to 8 km) and cloudy with precipitation.

From the official note composed in the Police station Labin after insight into the Port of Bršica surveillance camera's video record can be confirmed that it started to rain during bunkering from the fifth tank truck.

Shortly after, the rain developed in heavy rain with thunder. Air pressure was around 1012 hPa, air temperature about 21 °C.

According to the statement of the Master of vessel moored southern of the m/v "Fidelity", when he noticed the pollution it was heavy weather with thunder, due to which it can be assumed that the radio signal was weaker because he couldn't establish the contact with the authorities neither with the m/v



"Fidelity", and that also prevented him in his intention to direct a seaman to the m/v "Fidelity" and to warn them about the pollution.

The marine casualty took place in the early morning hours on 22 June 2018, during the astronomical, nautical and civil twilight. The sunrise was at 5:16, shortly after crew members stated that they discovered oil pollution. At that time, usually less crew members are on duty, fewer workers are in the port and there is less surrounding traffic from third sides that may react on observed irregularities in bunkering operation, but also oil pollution is less noticeable on the surface of the sea.

Due to heavy rains, Raša River water level raised and accelerated its run-down to the Bay of Raša which contributed to accelerated spread of pollution. According to the Croatian Hydrographic Institute, in the Bay of Raša, north-easterly wind blows down the high slopes of the east coast and it bounces back from many places on the west coast creating vortex. Also, the currents in the Bay of Raša are inward/outward direction with speeds of 0.3 knots that during strong north-easterly wind can reach up to 1.5 knot. From the stated it can be concluded that the impact of the north-easterly wind also contributed to the accelerated spread of pollution.

According to the above, it can be assumed that unfavourable weather conditions at the time of the marine casualty affected the work performance of crew members and fuel suppliers' employees. There is a possibility that some crew members, along with the Able Seaman on the gangway, had to perform their duties on deck but that they hid away from the deck due to unfavourable weather conditions and also that fuel suppliers' employees hid away in their vehicles during the bunkering from the following tank trucks which could have reduced the possibility that the Able Seaman on gangway or Second Officer on the bridge from greater distance and with those weather conditions notice that the fuel transfer is again in progress.

According to everything mentioned, it can be concluded that night conditions contributed to the late detection of the marine casualty, and unfavourable weather conditions contributed to the accelerated spread of pollution through the Bay of Raša and created difficulties with pollution clean-up action. Also, it can be assumed that this conditions negatively impacted the course of the marine casualty.

5.5.3. Safety environment and culture

By the statements of crew members it was concluded that most of them (besides the Master and the Chief Officer) did not know where to find procedures for bunkering operations within the Safety Management System nor which are their duties specified in those procedures. Also, it was established that the procedures were written in English and most of the crew members (except of the individuals on management positions) didn't speak English, therefore even if they knew where to find those procedures, they wouldn't be able to understand them.



The Chief Engineer was aware of the existence of the Bunker Operation Checklist that has to be completed before the commencement of bunkering operation, but he stated that preventive actions are done routinely so after the marine casualty it was established that some of very important items for bunkering operation were not conducted, even though they were marked as done. Even if all the preparatory works from the checklist were conducted before the start of bunkering, it cannot be expected that they will stay unchanged during the long-term bunkering operation. That is why it is necessary that crew members are familiarized with company's procedures, that they constantly check if the conditions on board correspond to the written procedures and checklists for their own safety, safety of others, vessel and protection of environment.

According to the received information, crew members were educated only through regular and routine familiarizations and drills. The last Oil Spill drill was held on 4 March 2018, and this drill was usually being conducted every 6 months so the next drill was supposed to be conducted in September 2018. From the crew list it was established that 18 crew members were embarked on board after the last Oil Spill drill, which represents 60 % of the total number of crew members. It can be assumed that until conducting the next drill such rate would be even greater. Considering the insufficient awareness and readiness of crew members and preparedness of adequate antipollution equipment, actions of crew before and after the marine casualty and the frequency of Oil Spill drills the conclusion is that the crew was not fully acquainted with the necessary preventive actions, procedures, instructions and equipment used in the event of pollution of the sea by ships.

5.6. MANAGEMENT

Management directly involved in bunkering operation of m/v "Fidelity" is divided on: management of m/v "Fidelity" and management of company INA, d.d.

Port basin Raša, on whose territory was bunkering operation done, is under management of the Port of Rijeka Authority that is elaborated separately.

All parties involved in bunkering operation of m/v "Fidelity" were, among other things, required to act in accordance with the provisions of the Maritime Code (Article 56, Paragraph 2), according to which port authorities, concessionaires of special purpose ports, natural and legal persons and maritime crafts that use the port must comply with the rules on the port's order, the safety of navigation, the protection of human life and the protection against pollution prescribed by the Minister.

5.6.1. The management of m/v "Fidelity"

Cargo vessel "Fidelity" was, at the time of the marine casualty, owned by Gigi Marine Ltd and operated by Mary Marine Ltd with headquarter in Beirut (Lebanese Republic). The operator possessed the Document of Compliance issued by the Lebanese Republic based on the audit conducted on 29



September 2016, and valid until 5 April 2021. Shortly thereafter, on 7 October 2016 m/v "Fidelity" obtained the Safety Management Certificate which certified that the operator and its management of the vessel are in compliance with the requirements of the approved Safety Management System. Safety Management Certificate was valid until 1 June 2021.

The company has, according to the ISM Code, issued the necessary procedures, instructions and checklists within the Safety Management System which are concerning the safety of the personnel, vessel and the environment. Among them is also procedure for Bunkering Operation and the Bunker Operation Checklist which are applicable for preparation of bunkering operations, duty allocation, actions during the bunkering operations, during topping up of the tanks and after completion of bunkering operations. However, after the occurrence of the marine casualty and after the analysis of crew members' actions, it can be concluded that procedures could have been even more detailed and include the activities in case of temporary interruption of the bunkering operation (e.g. to require that the fuel manifold valve is closed, to require posting a crew member on bunker station in order to prevent undesirable actions which are not under direct supervision of the competent crew members, rechecking of the checklist before the continuation of bunkering operation and similar).

In addition to issuing procedures, the company's duty under the ISM Code is to ensure that crew members receive relevant information and if it is necessary that they are educated on application of Safety Management System. Through the conversation with some crew members involved in the bunkering operation it was established that they did not know where the Safety Management System procedures can be found, and the one familiarized at least with the obligation to use the checklist had not used it properly. Related to that, the conclusion is that the company didn't establish and maintain the procedures for identifying any training which may be required in support of the SMS and ensure that such training is provided for all personnel concerned as per ISM Code (Part A: Implementation, Article 6.5), as amended.

Furthermore, the company's obligation is to establish procedures to ensure that ship's personnel receive relevant information on SMS in a working language or languages understood by them. On board m/v "Fidelity", English and Arabic have been specified as working languages. All crew members were citizens of the Syrian Arab Republic and they spoke Arabic so they were able to communicate with each other, but during the investigation it was established that most of the crew members did not speak English on which the procedures were written, so consequently they weren't familiarized with their duties, instructions and politics of the company about safety and environmental protection. Therefore, it can be concluded that the company did not establish procedures whereby the crew members would receive appropriate information on the Safety Management System in their working language or other language understood by them, as regulated by the provisions of the ISM Code (Part A: Implementation, Article 6.6), as amended.



5.6.2. INA, d.d.

Company INA, d.d. on 14 October 2016 as concessionaire entered into the Concession contract for carrying out economic activities of fuel delivery to vessels at the harbour area of the Port of Rijeka (except for Omišalj Basin) with Port of Rijeka Authority. The concession has been granted for 5 years until, and including, 8 July 2021.

In the documentation required for granting the concession, company INA, d.d. delivered to the Port of Rijeka Authority copies of vehicle traffic permits of vehicles owned by INA, d.d. which were supposed to be used for this activity as the proof of the disposition of required technical, professional and organizational abilities for realization of this concession. In delivered documentation, there was no mention of intention or possibilities to engage other fuel carriers to perform those economic activities.

By the Concession contract for carrying out economic activities of fuel delivery to vessels at the harbour area of the Port of Rijeka, except for Omišalj Basin, the company INA, d.d. is obliged to perform concession activities in accordance with the positive provisions of the Republic of Croatia on protection, in particular fire protection, occupational safety, the protection of the natural and working environment and those regulations directly or indirectly related to the performance of the relevant activity, as well as those regulations that refer to the order in the port. Besides that, the contract also stipulates that the concessionaire does not have the right to fully or partially assign the concession nor any other rights from the concession to third parties, except with the explicit consent of the Port of Rijeka Authority.

In this specific case, the company INA, d.d. engaged the company Manšped d.o.o., without explicit consent of the Port of Rijeka Authority, to transport and load Residual Marine Fuel on m/v "Fidelity" using 12 tank trucks. Besides company Manšped d.o.o., bunkering of m/v "Fidelity" was done by sister company Gržinčić d.o.o. and sub-contractor company Tehno-prom Rijeka d.o.o. By engaging other companies for carrying out economic activities of fuel delivery to m/v "Fidelity" (without the explicit consent of the Port of Rijeka Authority) the concessionaire did not act according to the provisions of the Concession contract for carrying out economic activities of fuel delivery to vessels at the harbour area of the Port of Rijeka (except for Omišalj Basin).

Furthermore, at the end of 2017, the company INA, d.d. entered into the Contract for performing a road transport service of black oils with company Manšped d.o.o. By this Contract, among the other things, is regulated that the carrier (Manšped d.o.o.) shall perform the road transport service of black oils by himself, i.e. that he has the right to engage another carrier (sub-carrier) for the execution of the service but only the sub-carrier approved by INA, d.d. at the time of signing the Contract. If, after signing the Contract, the need for engaging an additional sub-carriers is indicated, carrier has to obtain written consent from company INA, d.d. before they engage other sub-carrier. From the supporting documents of the Contract, it arises that company Manšped d.o.o. engaged the company Gržinčić d.o.o. as a sub-carrier, but company Tehno-prom Rijeka d.o.o. was not included in the documentation neither AIA got



the insight into written consent from INA, d.d. which approves the engagement of company Tehno-prom Rijeka d.o.o., and which points to the conclusion that the written consent was not obtained.

According to the information received from INA, d.d., it arises that they carry out professional trainings for all drivers in the system of company INA, d.d. Considering that the company Tehno-prom Rijeka d.o.o. was not approved as a sub-carrier by the company INA, d.d., it can be assumed that employees of the mentioned company were not in the system of the company INA, d.d. so consequently there was no basis to perform professional trainings of them and familiarization with internal procedures of the company INA, d.d. neither with binding regulations regarding the concession activity.

According to the Article 26 of the Maritime Demesne and Sea Ports Act (Official Gazette no 158/03, 100/04, 141/06, 38/09, 123/11, 56/16) the concessionaire is obliged to ensure that legal entities and natural persons who are performing subcontracting activities of a smaller scope (considering they obtained approval of the concession provider with the goal of better use of maritime demesne) do not utilize or economically use the maritime demesne contrary to the conditions under which the concession was given. Since it was already established that some of the fuel suppliers' employees were not familiarized with the existence of the ordinances related to the economic activities of fuel delivery to vessels and that is assumed that some of the drivers were not in the system of company INA, d.d. meaning that the company couldn't ensure their professional training for carrying out concession activity, it is concluded that company INA, d.d. wouldn't ensure economic use of maritime demesne in accordance with the law even if they got the approval of the Port of Rijeka Authority.

5.6.3. Port of Rijeka Authority

Port of Rijeka Authority, except with company INA, d.d., entered into the concession contract for carrying out economic activities of fuel delivery to vessels at the harbour area of the Port of Rijeka (except for Omišalj Basin) with 7 other companies.

According to Article 50 Paragraph 1 Subparagraph 6 of the Maritime Demesne and Sea Ports Act (Official Gazette no 158/03, 100/04, 141/06, 38/09, 123/11, 56/16) one of port authorities' activities is harmonization and supervision of concessionaires' work who carry out economic activities in port area.

Port of Rijeka Authority, among the other concessions, assigns a concession on maritime demesne for the purpose of performing security guarding services in the port area of the Port of Rijeka. This concession was granted to the company Securitas Hrvatska d.o.o. that was performing physical and technical protection of persons, property on entry-exit points and other places including supervision rounds.

By inspecting the Port Security Guards' log, i.e. records of entries and exits of drivers and tank trucks from the port basin Raša it is established that in the log weren't entered numbers of licenses that the drivers and vehicles should have had from which it can be concluded that they didn't possess those



licenses, and which is not in accordance with the provisions of Article 17 Paragraph 1 and 3 of the Act on Maritime Ship and Port Security (Official Gazette no 108/17). According to those provisions, port authority has to issue licenses in form of cards or other form to each person and road or rail vehicle that is constantly or periodically performing activities or constantly or periodically for other reason staying in the port area. In this case, concessionaire did not apply for the issuance of licences for the fuel suppliers' employees who were transporting and loading the fuel on board m/v "Fidelity" neither for the vehicles they were driving. The entry of the fuel suppliers' employees in the port area without those licenses was permitted by the employees of the security company that, as mentioned before, are also one of the concessionaires of the Port of Rijeka Authority.

On that way, fuel suppliers' employees and tank trucks of the companies without concession or explicit consent from the Port of Rijeka Authority got permission to enter the port. Also, it is established that the same Port Security Guards didn't check any personal documentation of the fifth tank truck driver because in the log was, when the fifth tank truck entered the port area, logged the name of the first tank truck driver who was supposed to drive that tank truck but he had been replaced because his working hours ended.

Prior to the arrival of a vessel carrying dangerous or polluting substances or other vehicles transporting them in the port, the Port of Rijeka Authority must receive a written Declaration of Dangerous or Polluting Goods in accordance with the Article 49 of Ordinance on Order in the Port and Conditions of Use of the Port in the Area Under the Management of the Port of Rijeka Authority (except part of the Omišalj Basin), and in this individual case of bunkering of m/v "Fidelity" Declaration should have been submitted by INA, d.d. as a shipper (in accordance with the Article 51). In this Declaration, the undersigned certifies that the contents of the said consignment are fully and accurately described by the proper technical name, that it is properly classified, packed, marked and labelled and that it is in all respects suitable for carriage in accordance with applicable international and national regulations. Contrary to the provisions of the Article 51, in case of bunkering of m/v "Fidelity", the Declaration with the appendix in which are stated 3 drivers and 3 towing vehicles and trailers for performing this activity (without the indication in which companies where drivers employed nor who is the owner of the vehicles) had been signed and submitted to the Port of Rijeka Authority by the ship's agent and as such it was accepted by the Port of Rijeka Authority. After the marine casualty, it was found that the information from the Declaration is incomplete because the driver of the fourth tank truck together with the towing vehicle and trailer and the fifth tank truck driver hadn't been stated in the Declaration, and instead of the third trailer in the port had been delivered trailer with different registered number.

5.7. WORKING AND LIVING CONDITIONS

There are no facts that would indicate to a conclusion that fuel suppliers' working conditions and working and living conditions on board (work and rest hours, accommodation, sleep and nutrition,



sanitary conditions etc.) were below the standard, which could have had an impact on the course of the marine casualty.

5.8. IMPACT OF LEGISLATION

During the bunkering of m/v "Fidelity" the floating boom wasn't used because its usage was not prescribed by law nor bylaw acts. Taking into account the environmental sensitivity of the Bay of Raša and the risks associated with bunkering of vessels, it can be considered that the demand for the use of floating booms around vessels during the bunkering could have affected the outcome of marine casualty.

By the Article 112. of the Ordinance on Handling of Hazardous Substances, the Conditions and Manner of Transport in Maritime Traffic, Loading and Unloading of Hazardous Substances, Bulk and Other Cargo in Ports and the Manner for Preventing the Spreading of Oil Spills in Ports (Official Gazette no 51/05, 127/10, 34/13, 88/13, 79/15, 53/16, 41/17) is regulated the obligation to use the official Bunkering Checklist only in cases when fuel is loaded on board from another vessel. It is established that some port authorities by their internal provisions regulate the obligation to use the Bunkering Checklist also in cases of loading the fuel on board from the tank trucks but leaving the possibility to responsible person of the fuel supplier to mark some questions as "not applicable" (N/A).

After the marine casualty, the need for regulating the obligation to use the official Bunkering Checklist specific for bunkering of vessels from tank trucks and/or terminals on the national level was shown. The use of Bunkering Checklist can contribute to the execution of safer bunkering operation, and serve as a reminder to the participants about preparatory actions before the commencement of loading and important things to pay attention during the entire bunkering operation.



6. CONCLUSIONS AND MEASURES TAKEN

6.1. FINDINGS

Before the commencement of bunkering operation, the Chief Engineer completed and signed the Bunker Operation Checklist through which he confirmed that all preparatory works for bunkering operation have been done. That checklist was required to be completed and signed by the Second Engineer and handed over to the Chief Engineer for approval which was not done in this case. By the inspection survey of the vessel it was established that some of the preparatory works from the checklist were not carried out and by the analysis it was established that those had a significant impact on the course and the outcome of the marine casualty.

By the Bunker Operation Checklist, Chief Engineer confirmed (among the other things) that the effective means of communication have been established with the bridge and fuel suppliers' employees. By the analysis it was established that in this case communication between the vessel and the fuel suppliers' employees came down to the hand gestures and only twice a short verbal communication without any means of communication. Taking into account all conditions prevailing at the time of marine casualty, it was concluded that effective communication between crew members and fuel suppliers' employees was not established, and that the same had a significant impact on the course and the outcome of the marine casualty.

At the time of the marine casualty, the Able Seaman was the only person on duty on the deck (on gangway). His view from the gangway to the place where tank trucks were located was obstructed by the cattle ramp, hay and fodder stowed on the terminal, and he was not allowed to leave the place of his duty. It can be assumed that the rain and then heavy rain with thunder had a negative impact on his ability to observe by sight and hearing the actions happening around the vessel. According to the company's procedure Bunkering Operation on board the m/v "Fidelity", two crew members should have been assigned to monitor and control the condition of vessel's mooring equipment, as well as the early detection and reporting of oil spills into the sea. Also, crew members of m/v "Fidelity" were obliged to act in accordance with the security level 1, i.e. among the other things they had to pay particular attention to monitoring of deck areas and areas surrounding the ship and supervising the handling of ships stores. According to the vessel's Table of Shipboard Working Arrangements, two additional Ordinary Seamen and one Wiper were envisaged to be on duty at that time so they could do some of the mentioned tasks.

Upon discovery of the pollution, according to the Master's statement he informed the Second Officer to announce the general alarm which (according to his statement) he immediately did. By the analysis of the statements of other crew members and the information received from the Port Security Guards placed close to the vessel, it can be concluded that the general alarm was not even announced. When crew members found out about the pollution, they started cleaning and preventing further pollution



and only after about 2 hours and 15 minutes the Master attempted to notify the authorities about the event, even though his obligation is to notify the Ministry without delay. By the analysis of the Master's actions, it was concluded that at first he tried to hide and as much as possible clean the pollution.

Even though the company has issued the necessary procedures and checklists for the bunkering operation, the crew members of m/v "Fidelity" (except of the Master and Chief Officer) did not know where they can find those documents. Also, those documents were written in English, but the most of crew members did not speak English, indicating the inability to use these procedures even if they knew where they could find them.

From not knowing and not following company's procedures by crew members, ineffective internal communication and insufficient familiarization and training of the crew members for oil spills it can be concluded that safety environment and culture on m/v "Fidelity" had an impact on the course and the outcome of the marine casualty.

Through the informative conversation with fuel suppliers' employees it was established that when asked about ordinances they have to adhere to during the bunkering operation of vessels, the persons who were asked about it did not know the answer to that question or they claimed that such ordinances don't exist. This points to the fact that they were not familiar with the positive provisions of the Republic of Croatia on protection, in particular fire protection, occupational safety, the protection of the natural and working environment and those regulations related to the order in port, handling of hazardous and pollutant substances and as well with those directly or indirectly related to the performance of the relevant activity including the internal procedures.

Taking into account the fact that the employee responsible for operating the pump and electric generator stated that he doesn't speak English and that he was performing a task where he was representing an important link connecting crew members with tank truck drivers so he had to communicate and cooperate with both sides to ensure the safe operation, it can be considered that in that field he was not competent for the job he was doing. It is worth of mentioning that next to him, during the bunkering operation from the fifth tank truck, was only the fifth tank truck driver who was (according to his statement) inexperienced in the bunkering operation of vessels from tank trucks.

Before commencement of the bunkering operation, the responsible person of the fuel supplier together with the responsible person on board had to agree about safety details of the operation and carry out the official Bunkering Checklist which usage is common practice in the area of the Port of Rijeka Authority. By the checklist, both sides had to accept and confirm that the conditions for the bunkering operation are satisfactory and by the analysis it was established that the conditions were not satisfactory for conducting safe bunkering operation. The obligation for using the official Bunkering Checklist is regulated by the Ordinance on Handling of Hazardous Substances, the Conditions and Manner of Transport in Maritime Traffic, Loading and Unloading of Hazardous Substances, Bulk and Other Cargo in Ports and the Manner for Preventing the Spreading of Oil Spills in Ports (Official Gazette



no 51/05, 127/10, 34/13, 88/13, 79/15, 53/16, 41/17) only in cases when the fuel is loaded on board from another vessel. By the analysis it has been established the need for regulating the obligation to use the official Bunkering checklist which is specific for bunkering of vessels from tank trucks and/or terminals.

By the analysis it was established that the night conditions contributed to the late detection of the marine casualty because at that time less crew members are on duty and fewer workers in the port, there is less surrounding traffic from third sides, and also oil pollution on the surface of the sea is less noticeable. Unfavourable weather conditions had an impact on the course and the outcome of the marine casualty in a way that they prevented the Master of the vessel moored southern of m/v "Fidelity" in his intention to direct a seaman to the m/v "Fidelity" and to warn them about the detected pollution and probably affected his possibility to inform the competent authorities, contributed to the accelerated spread of pollution through the Bay of Raša and created difficulties during the pollution clean-up action, and it is assumed that they affected the work performance of crew members and the fuel suppliers' employees who were probably sheltering from the rain and therefore reduced the likelihood to be noticed by the crew members on duty and to realize that the continuation of the bunkering operation was in progress. From above mentioned and the analysis it is established that the concessionaire and/or any other person handling hazardous substances had to, in accordance with the Article 6 of the Ordinance that Specifies Special Safety, Protection and Other Measures for Handling Hazardous Substances in the Port Area Operated by the Port of Rijeka Authority, suspend his work.

The Port of Rijeka Authority granted the concession to company INA, d.d. for carrying out economic activities of fuel delivery to vessels at the harbour area of the Port of Rijeka (except for Omišalj Basin) and to company Securitas Hrvatska d.o.o. for performing the security guarding services in the harbour area of the Port of Rijeka. One of port authorities' activities is the harmonization and supervision of the work of concessionaires who carry out economic activities in the port area. By the analysis it was established that at the night of the marine casualty the employees of the security company permitted the entry in the port area of the fuel suppliers' employees (who were not concessionaires and didn't have explicit consent from the Port of Rijeka Authority) without possession of the licences that each person and road or rail vehicle that is constantly or periodically performing activities or for other reason staying in the port area has to possess. Also, it was established that the Port Security Guards didn't check any personal documentation of the fifth tank truck driver because in the log was, when the fifth tank truck entered the port area, logged the name of the first tank truck driver.

Company INA, d.d. had to, before carrying dangerous or polluting goods into the port area, submit a written Declaration of Dangerous or Polluting Goods to the Port of Rijeka Authority. In case of the bunkering operation of m/v "Fidelity", Declaration with the appendix in which were stated 3 drivers and 3 towing vehicles and trailers for performing this activity (without the indication in which companies where drivers employed nor who is the owner of the vehicles) had been signed and submitted to the Port of Rijeka Authority by the ship's agent and as such it was accepted by Port of



Rijeka Authority. After the marine casualty, it was found that the information from the Declaration were not fully corresponding the actual condition during the bunkering.

During the bunkering of m/v "Fidelity" the floating boom wasn't used because its usage was not prescribed by law nor bylaw acts. By the analysis it was established that usage of floating boom around m/v "Fidelity" during bunkering could have affected the outcome of marine casualty.

By the Concession contract for carrying out economic activities of fuel delivery to vessels at the harbour area of the Port of Rijeka (except for Omišalj Basin) granted by the Port of Rijeka Authority to the company INA, d.d. it is regulated that INA, d.d. as concessionaire does not have the right to fully or partially assign the concession nor any other rights from the concession to third parties without the explicit consent of the Port of Rijeka Authority. In this case, company INA, d.d. engaged the company Manšped d.o.o., without explicit consent of the Port of Rijeka Authority, to deliver and load 12 tank trucks of Residual Marine Fuel on m/v "Fidelity". Beside company Manšped d.o.o., bunkering of m/v "Fidelity" was done by their sister company Gržinčić d.o.o. and sub-contractor company Tehno-prom Rijeka d.o.o.

INA, d.d. entered into the Contract for performing a road transport service of black oils with company Manšped d.o.o. By this Contract, among the other things, is regulated that the company Manšped d.o.o. (carrier) has the right to engage sub-carrier for the execution of the service but only the sub-carrier approved by INA, d.d. at the time of signing the Contract. If, after signing the Contract, the need for engaging additional sub-carriers is indicated, carrier has to obtain written consent from company INA, d.d. before they engage other sub-carrier. From the supporting documents of the Contract, it arises that company Manšped d.o.o. engaged the company Gržinčić d.o.o. as a sub-carrier, but company Tehno-prom Rijeka d.o.o. was not included in the documentation neither AIA got the insight into written consent that INA, d.d. approved the engagement of company Tehno-prom Rijeka d.o.o. which points to the conclusion that the written consent was not obtained.

Related to that, and considering that INA, d.d. carries out professional trainings only for drivers in the system of company INA, d.d., it can be assumed that employees of the company Tehno-prom Rijeka d.o.o. were not in the system of the company INA, d.d. so consequently there was no basis to professionally train them and familiarize with internal procedures of the company INA, d.d. neither with binding regulations regarding the concession activity.

The assumed amount of the Residual Marine Fuel type F RME 180, UN number 3082 that as the outcome of this marine casualty have been spilt in the sea is between 3 and 5 tonnes. From the Safety Data Sheet it arises that Residual Marine Fuel is very toxic to aquatic life with long lasting effects, it is harmful if inhaled and may cause cancer, it can cause damage to organs through prolonged or repeated exposure and it is recommended to seek medical attention after exposure.



6.2. CAUSES

In this part, contributing factors and the immediate (decisive) cause of the marine casualty are processed.

6.2.1. Contributing factors

The impact on the course and outcome of the marine casualty had:

- Omission to undertake necessary preventive actions before the commencement of bunkering operation, and completing mandatory checklists without ensuring their implementation and compliance.
- Leaving the fuel manifold valve and Fuel tank no 4 valve open and hose connected without any supervision of crew members and without established effective communication with fuel suppliers' employees.
- Continuation of bunkering operation by fuel suppliers' employees without previous notification to responsible crew members and their approval.
- Omission to perform monitoring of deck areas and areas surrounding the ship and supervising the handling of ships stores, as well as early detection and reporting of oil spills into the sea by the crew members on board.
- Incomplete application and implementation of the Safety Management System in accordance with provisions of the International Safety Management Code.
- Non-compliance with the provisions of the Concession contract for carrying out economic activities of fuel delivery to vessels at the harbour area of the Port of Rijeka, except for Omišalj Basin, by engaging another company to deliver and load the fuel on m/v "Fidelity" without the written approval of the Port of Rijeka Authority.
- Engaging additional sub-carrier by the company Manšped d.o.o. without written consent from the company INA, d.d.
- Unfamiliarity with binding law and bylaw regulations by fuel suppliers' employees (those asked about it).
- Permission to entry on the harbour area issued to fuel suppliers' employees and tank trucks of the companies without concession or explicit consent from the Port of Rijeka Authority to perform economic activity of fuel delivery without licenses that have to be possessed by the persons or vehicles that are constantly or periodically performing activities or for other reason constantly or periodically staying in the harbour area.
- Insufficient supervision of concessionaires' work by the Port of Rijeka Authority.



- Unfavourable weather conditions at the time and after the marine casualty and night conditions during the bunkering operation of m/v "Fidelity".
- Not prescribed obligation to use floating booms during bunkering operations in the Port of Bršica.
- Not speaking English or other language in which they could efficiently communicate with the crew by the key participants of the bunkering operation.
- Insufficiently trained crew members of m/v "Fidelity" for emergency situation of oil spill.
- Belated notification of competent authorities by crew members because of the attempt to hide and as much possible clean the pollution.

6.2.2. Immediate cause

Spillage of Residual Marine Fuel from the fuel oil tank on the deck and then into the sea, was due to human factor caused by inattention, insufficient familiarization and non-compliance with the procedures and international, national or internal regulations, especially regarding preventive measures and importance of effective communication before, during the time, after interruption and after completion of the bunkering operation.

6.3. MEASURES TAKEN

6.3.1. Measures taken by the Port of Rijeka Authority

According to gathered information, the Port of Rijeka Authority has taken measures to prevent or reduce the number of marine casualties and their consequences through increased control over the bunkering operations of vessels.

According to the information received from the Port of Rijeka Authority, after this marine casualty the amendments of their internal regulations have been initiated.

At 133rd session held on 5 September 2018, the Management Board of the Port of Rijeka Authority adopted a revised Ordinance that Specifies Special Safety, Protection and Other Measures for Handling Hazardous Substances in the Port Area Operated by the Port of Rijeka Authority.

By applying the new Ordinance, better supervision has been introduced in the supply and handling of fuels on moored vessels, especially in the Port of Bršica. Among the introduced amendments, the following has to be mentioned:

- **Article 7, Paragraph 5 and 6** – the transfer of Residual Marine Fuels is prohibited between tanks of vessels berthed in the area of the Port of Rijeka Authority. Exceptionally, vessels shall be



allowed to transfer fuel between tanks only in case the safety and seaworthiness is compromised, but with the additional supervision of such operations by an expert appointed by the Port of Rijeka Authority.

- **Article 10** – The concessionaires allowed to use port infrastructure and superstructure and perform activities in the port area, are obliged to harmonize, i.e. to adopt internal regulation for handling of hazardous substances while performing their concession activities in the port area within 6 months. Such regulation should be in accordance with the Ordinance that Specifies Special Safety, Protection and Other Measures for Handling Hazardous Substances in the Port Area Operated by the Port of Rijeka Authority, Ordinance on Handling of Hazardous Substances, the Conditions and Manner of Transport in Maritime Traffic, Loading and Unloading of Hazardous Substances, Bulk and Other Cargo in Ports and the Manner for Preventing the Spreading of Oil Spills in Ports and other applicable regulations governing special manner of operation and protection measures regarding hazardous substances in the territory of the Republic of Croatia. The concessionaires shall also within 30 days appoint their expert to supervise handling of hazardous substances and inform the Port of Rijeka Authority on such appointment.
- **Article 12** – Handling of hazardous substances in port and on board shall be stopped and at the same time all ventilation openings shall be closed:
 1. During adverse weather conditions that may endanger safety of vessel or equipment in the harbour.
 2. In case of thunders and atmospheric discharges.
 3. When a tugboat is approaching an oil tanker on which the oil is handled, until it is moored.
 4. When there is a malfunction of any oil handling device, and this malfunction can cause pollution of the sea or endanger human lives.
 5. When a fire occurs in the port area.
- **II. HANDLING OF FUEL – Article 13**
 1. Bunkering of vessels/hydroplanes may only be carried out at places designated by the Port Authority with the approval of the Harbour Master's Office.
 2. The Master of vessel/hydroplane or a person authorized by him shall, at least 24 hours before commencement of bunkering, request the approval of the Port of Rijeka Authority and submit a written Declaration of Dangerous or Polluting Goods.
 3. Bunkering operation of vessel shall not commence without approval of the Port of Rijeka Authority.
 4. Bunkering operation of vessels in the Port of Bršica shall be carried out during the daylight and with precautionary measures requiring installation of a floating boom around the vessel prior to commencement of bunkering operation.



5. Upon timely invitation of concessionaire for fuel delivery to vessels, the floating boom around the vessel in the Port of Bršica shall be set up by the concessionaire of the Port of Rijeka Authority, who has obtained approval for these activities.
6. If bunkering of vessel is going to be provided from another vessel or tanker, the authorized officers on vessels are obliged to, prior to the commencement of the bunkering operation, agree the procedures and to complete the Bunkering Checklist, and to organize setting up a floating boom at the Port of Bršica.
7. The Master is obliged to inform the Harbour Master's Office on the commencement and completion of the bunkering operation of the vessel.
8. If bunkering of vessel is carried out from a vehicle, the concessionaire for fuel delivery shall be obliged, before the commencement of the bunkering operation, to:
 - Ensure supervision by an expert of the concessionaire and/or other person who is carrying out the work or for whom the work is being carried out (who possesses a Certificate for Handling Hazardous Cargo (D-27)) for the entire duration of bunkering operation.
 - Ensure the presence of the duty inspector of the Port of Rijeka Authority prior to the commencement of bunkering operations.
 - Ensure setting up a floating boom around vessel in the Port of Bršica.
9. The Master or the authorized officer on board and expert of the concessionaire shall take all prescribed fire protection measures, as well as measures to prevent pollution of the marine environment and complete the Bunkering Checklist before commencement of the bunkering operation.
10. During the bunkering operation of vessel, the persons whose presence is not necessary shall not stay on board or shore.
11. The bunkering operation of vessel shall be interrupted during adverse weather conditions, thunders and atmospheric discharges.
12. A vessel performing bunkering in the port shall hoist a red flag during the day and at the night exhibit one all-round red light.
13. Shipboard Oil Pollution Emergency Plan shall be on standby.
14. During bunkering operation of hydroplane from a vehicle, presence of a fire truck with all necessary equipment and in particular equipment for extinguishing a fire caused by the ignition of an aviation fuel shall be provided at the location of bunkering.
15. Locations for bunkering operations shall be properly marked, accessible with emergency vehicles and protective equipment and supplied with fire-fighting hoses.
16. The use of flexible hose for fuel supply shall only be permitted if the following conditions are met:
 - that the flexible hose has a certificate with the date of testing not older than 12 months
 - that the maximum working pressure is indicated
 - that the minimum and maximum temperature of fluid is indicated
 - that there are no visible mechanical damages.



17. It is not allowed to leave vehicles loaded with hazardous substances in the port area without supervision.
18. The Harbour Master's Office may prohibit the commencement and continuation of bunkering, as well as order the vessel or vehicle to leave the port for safety reasons and for protection of humans and the environment or the failure to comply with prescribed provisions.
19. It is prohibited to bunker vessels and supply them with other materials while handling with hazardous substances.

Port of Rijeka Authority provided co-financing of the availability of floating booms used for girding of vessels in the Port of Bršica and the presence of persons who will set up the booms prior to the commencement of bunkering operations and remove it upon completion. Additionally, in order to prevent the possible spread of pollution, a boom is permanently installed below the pylons of berths 4 and 5.

Port of Rijeka Authority on 15 April 2019 issued a new Ordinance on Issuing Licenses for Movement or Stay of Persons and Vehicles in the Area of the Port of Rijeka that regulates the looks, purpose, content, way of publishing, the usage, return and revoking of licenses (identification cards) for movement or stay of persons and vehicles on the harbour area of the Port of Rijeka.

Also, as per information received from Port of Rijeka Authority, they plan to insist on consistent application of regulations in relation with the submission of the Declaration of Dangerous or Polluting Goods which are in line with the Ordinance on Handling of Hazardous Substances, the Conditions and Manner of Transport in Maritime Traffic, Loading and Unloading of Hazardous Substances, Bulk and Other Cargo in Ports and the Manner for Preventing the Spreading of Oil Spills in Ports (Official Gazette no 51/05, 127/10, 34/13, 88/13, 79/15, 53/16, 41/17). Also, the plan is to request from all the concessionaires for the fuel delivery to vessels to issue internal procedures and perform education of the drivers in accordance with the procedure, ask all of them to deliver those procedures for insight and prepare the operative instruction with all necessary and prescribed obligations.



6.3.2. Measures taken by INA, d.d.

According to the information obtained from INA, d.d., on 17 December 2018 the internal document Guidelines for Bunkering of Vessels from Tank Trucks was issued, which regulates the rules of bunkering from tank truck on vessel in the area of port authorities on Adriatic and inland ports. The purpose of this document is to ensure the supply of the market in specific conditions of unloading the fuel from tank truck on vessel in a safe manner, and simultaneously to ensure that the right amount and quality of goods is delivered at the right time. Guidelines regulate the steps of the whole process and the responsibility of the each person involved. Document was distributed to all contract carriers and sub-carriers of the company INA, d.d.

By those Guidelines, the obligation to carry out the form Approval for Bunkering of Vessel is issued. The purpose of this form is that driver and representative of vessel have to approve commencement of the bunkering operation from each tank truck (in order of unloading) by their signature and without the signatures, the bunkering operation shall not commence. By prompt fulfilment of this form, in the future will be prevented performing of bunkering operation without the knowledge and approval of one of the involved sides.

Also, drivers' responsibility is regulated so that they shall during the whole time of bunkering be close to the tank truck and in contact (visual or via VHF) with the responsible person on board. Driver and responsible person on board have to agree proper means of communication and gestures for emergency stop of bunkering. Also, drivers are responsible to immediately stop the bunkering operation and close all valves if the interruption of communication occurs between the driver and the responsible person on board, in case of adverse weather conditions which might endanger the safety of the operation and also during the thunders and atmospheric discharges.

In accordance with the document Guidelines for Bunkering of Vessels from Tank Trucks, the document Short Guides for Drivers – Bunkering of Vessels from Tank Trucks was issued. Document contains short instructions to the drivers about safe bunkering operation of vessels.

In addition, experts in possession of required Certificate for Handling Hazardous Cargo have been appointed to participate in bunkering of vessels from tank trucks.

After the marine casualty, INA, d.d. included specifics in bunkering of vessels in their regular training program for drivers. Also, they conducted formal trainings of logistics managers according to the procedure Reporting System and Incident Investigation in the Field of Health, Safety, Environment and Fire.

Also, as one of the measures taken, INA, d.d. states that they work on the technical simplification of the bunkering operation of vessels. Until the marine casualty, bunkering operation was usually done using the portable pump. In 2019, approximately 50 % of the tank trucks for carrying black oils were



equipped with fixed pump placed on the tank truck. By doing so, they consider the operation technically simpler and safer (less connections, i.e. direct connection tank truck – vessel).



7. SAFETY RECOMMENDATIONS

In this marine casualty, the Air, Maritime and Railway Traffic Accidents Investigation Agency issued the following safety recommendations:

AIN05-SR-1/2020: Company Mary Marine Ltd should ensure that all information on the Safety Management System is available to the crew in working language or other language understood by them.

AIN05-SR-2/2020: Company Mary Marine Ltd should establish education or other methods of familiarizing crew members with the Safety Management System, its implementation and application in everyday activities.

AIN05-SR-3/2020: Company Mary Marine Ltd should amend the procedure Bunkering Operation with instructions in case of temporary interruption of the bunkering operation.

AIN05-SR-4/2020: It is recommended to the company Mary Marine Ltd to prescribe conduction of Oil Spill drills at intervals of not more than 3 months and obligation to conduct a training session for all crew members involved in bunkering operation every time before scheduled bunkering operation, which should familiarize them with particulars of the operation and their duties.

AIN05-SR-5/2020: Company INA, d.d. should in an effective manner ensure the consistent implementation of law, bylaw and concession provisions with emphasis on procedures in case of assigning the concession or any other rights from the concession to third parties, and in that case ensure their compliance with those provisions.

AIN05-SR-6/2020: Company INA, d.d. should, during the entire bunkering operation from the vehicles, ensure the presence of expert who must be fluent in English or another language in which he or she can effectively communicate with responsible crew members.

AIN05-SR-7/2020: Port of Rijeka Authority should establish enhanced supervision of the work of concessionaires handling hazardous or pollutant substances and the ones providing security guarding services in order to avoid the use of concession activities contrary to the binding law, bylaw and concession provisions.

AIN05-SR-8/2020: Ministry of the Sea, Transport and Infrastructure should within the amendments of the Ordinance on Handling of Hazardous Substances, the Conditions and Manner of Transport in Maritime Traffic, Loading and Unloading of Hazardous Substances, Bulk and Other Cargo in Ports and the Manner for Preventing the Spreading of Oil Spills in Ports prescribe the obligation to use a customized checklist for bunkering operations of vessels from vehicles and from terminals (as the



official Bunkering Checklist from the Annex 4, whose usage is regulated by the Article 112 Paragraph 6 only in cases when fuel is loaded on board from another vessel).