

**Report No.: 05.Comm.Acc.Mar-FTA - Issued on: 10/22/2017**

## Maritime accident report

Ship capsizes

during container loading operations

# Mona

Khaled Port / Sharjah

United Arab Emirates

The date of the accident is August 25, 2017



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**disclaimer**

It should be noted that the purpose of this report is only to find out the reasons that led to the accident Learning from them as lessons learned will help prevent it from happening again in the future. Also, let it be known that this report was not issued for the purpose of identifying the wrong party and placing responsibility on him, and it may not be used by any party or against any party.

United Arab Emirates. The country's local time report is this Dates and times mentioned are **all**

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Investigation. Our ship and crew documents are available in accordance with this report. All time representations are contained herein

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**Notice and procedures**

**1. Notification:**

On 4/9/2017, the Federal Authority for Land and Maritime Transport received an e-mail from the headmaster of Khalid Port in the Emirate of Sharjah, stating that a commercial ship had capsized on 25/8/2017, while the ship was on the dock of the container terminal in the port and during its loading operations with containers. 2.

**Procedures: On**

4/9/2017, the senior management of the Federal Authority for Land and Maritime Transport By directing the appointment of (2) marine inspectors to go to the site of the accident to investigate its circumstances and determine its causes.

**3. Transfer: •**

On September 5, 2017, the specialists were transferred to Khalid Port - Sharjah and met with the port superintendent as well as a number of crew members of the ship involved in the accident, in addition to carrying out the necessary technical inspection of the ship and collecting available documents related to the accident.

• On September 20, 2017, the specialists moved again to Khalid Port - Sharjah and met the port superintendent, as well as the container loading officials at the port, and collected a number of additional documents related to the

accident. • The technical team was unable to inspect the ship or any of its devices or equipment, as it turned out that all papers and documents related to the ship and its crew were lost as a result of its sinking.

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**The facts**

1. On August 24, 2017, the commercial ship Mona arrived at Khalid Port - Sharjah, carrying a shipment of empty containers of different sizes (20 - 40 feet), where it was docked on its right side.

All ballast tanks 2. When the ship Mona arrived at the port, and according to the captain's statement, they were empty except for the upper ballast tank No. (2) on the right side, which contains about (50 tons) of ballast water (total capacity about 180 tons) for the purpose of equalizing the weight of the ship's crane located on the left side.

3. Upon the ship's arrival at the port, container handling operations began directly. According to the plan, the ship will unload the empty containers and load the filled containers alternately. According to what is also scheduled, the ship will be loaded with (94) packed containers measuring (40 feet) with a weight of Total (2608.75 metric tons).

4. While the ship was on the dock and during cargo handling operations, it received some quantities of fresh water, and the condition of the tanks on it, according to the captain, officers and engineers, was as follows:

- The upper tank No. (2) on the right side is partially filled and contains about (50 tons of balance water) out of its total capacity, which is about (180 tons), which represents a percentage of 30% According to the captain, first officer and chief engineer, this tank was emptied later, after the start of the loading operations, specifically at 14:00 on 25/8/2017.
- The front central fresh water tank (TK FP) is partially filled and contains about (30 tons) of fresh water, representing 30%.
  - Rear central fresh water tank (TK.APT) (contains about (40 tons) of fresh water, representing 97%.
- 20 tons of diesel fuel in each of the two fuel tanks, representing about 80% of the fuel their capacity.
- With the exception of the tanks mentioned above, the rest of the ship's tanks, including the double bottom tanks, were empty except for very small quantities of non-retractable water, which represented less than 1% of the total total capacity of each tank.

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5. According to what is decided and according to the loading plan and the distribution of the container shipment, the ship will load (38) packed containers measuring (40) feet below the main deck and two layers high.

(04 & 02 Tier) with a total weight of 1244.6 metric tons.

6. According to what was decided and according to the loading and container shipment distribution plan, the ship will load (56) packed containers measuring (40) feet on the main deck, four of which were subsequently canceled in the third layer (86 Tier) (so that the total number of containers was scheduled). Loaded on the main deck (52) containers with a height of only two layers (84 & 82 Tier) and a total weight of 1306.6 metric

tons.

7. On 24/8/2017, the Planning Department at the container terminal submitted a plan for loading the containers onto the ship to the captain of the ship, who accepted it, signed it and sealed it with the ship's official seal.

8. On 25/8/2017, at approximately 11:41 a.m., the ship was loaded with packed containers, after conducting the process of determining and verifying container weights using method (1) through the port management (the weight of the truck and the container together, and then subtracting the weight of the truck from gross

weight).

9. On 25/8/2017, at approximately 15:41, the loading of the packed containers in the cargo holds below the surface was completed, as it was found from the actual loading record that there was some change in the distribution and loading of containers in the holds below the surface (from top to bottom and from right to left and from back to front) from what was previously planned, as this change also included the addition of (2) containers under the surface. The first one No. 4027621 MHCU at site 04-03-02

With a weight of 32.54 tons, the second No. 4027220 MHCU was on site 04-04-02 and weighed 32.86 tons.

Thus, the total number of containers under the deck became (40) instead of 38 as planned, with a total weight of 1306.25 tons instead of 1244.6 tons.

10. On 25/8/2017, at approximately 16:36, the containers were loaded onto the upper deck of the ship (the cargo hold covers).

11. At approximately 17:37, the loading of the first layer above the hold covers (82) was completed, except for 2 containers at locations 06-14-82 and locations 05-10-82, where the weight distribution on the ship was as

follows:

a. The total weight of the containers below deck inside the cargo holds = 1306.25 tons.

B. The total weight of the containers above the deck on the hatch covers = 736.31 tons.

T. The total weight of the containers on the starboard side of the ship = 873.29 tons.

w. Total weight of containers on the left side of the ship = 866.61 tons.

C. 110 tons of fresh water and fuel in the ship's lower tanks.

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h. The balancing tanks (double bottom and top) are empty except for a very small amount

poignant.

12. At approximately 17:41, the loading of the second layer of packed containers began, starting with the front part of the ship and at location 02-84, where (4) containers were loaded with a total weight of 70.58 tons. Loading began from the left side of the ship (facing the sea) 02. -04-84, then 02-02-84, then 02-01-84, ending in the fourth container on the right side (facing the dock)

On site 02-03-84 and this was done at approximately 17:47

13. It also appears that at about 17:47 another container weighing 18.37 tons was loaded on the deck of the ship - first layer (82) to the starboard side at the site 10-05-82 (an illustration of the condition of the ship is attached).

14. According to the ship's captain, at approximately six o'clock in the evening, he noticed that the ship had begun to lean on its right side at an angle of approximately 4 to 5 degrees, and he immediately requested that container loading operations on the ship be stopped.

15. According to the actual ship loading record issued by the port administration, it shows that loading operations stopped at approximately 17:47 and then resumed again at approximately 19:27 for a period of interruption of approximately (one hour and forty minutes).

16. According to the version of the port administration (planning and loading officials), they reported that the ship's captain had requested to stop the loading work at around six o'clock in the evening due to the inclination of the ship, and that his request was responded to and the work was actually stopped until their return at 19:27, and it became clear to them that the ship had returned to the vertical position, and accordingly, they continued with the operations of loading containers in the second layer (84).

17. Through the actual ship loading record issued by the port administration, a number (14) containers were added in the second layer (84) during the period from 19:27 until 20:02, with a total weight of 286.63 tons, distributed as follows:

a. Number (8) containers on the left side of the ship, with a total weight of 146.81 tons.

B. (6) containers on the right side of the ship, with a total weight of 139.82 tons.

17. At approximately eight o'clock in the evening, after loading the containers mentioned in item No. (16) above, the ship began to tilt again to the right side to a greater degree. The captain immediately asked the loading officials to begin unloading the containers on the upper deck (84) to address the situation, as it happened at one o'clock. 21:30 The process took about an hour and a half due to the large tilt of the ship and the need to bring in a regular crane and unload (4) containers using slings.

with a gross weight of 89.12 tons all starboard rows 03, 01, 01 and 03.

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18. Despite the unloading of the four containers according to item No. (17) above, this procedure was not useful, and the ship continued to tilt until it reached about more than (9) degrees of inclination, which led to the inability to unload any other containers, since these The containers, as a result of the large inclination, press hard on the Locks Twist, which led to the inability of the crew to open these locks, and thus the inability to unload any other containers.

19. At approximately 21:50, the captain issued orders to the crew to evacuate the ship and head to the pier in order to preserve their lives.

20. The ship continued to tilt to the right until it turned on its right side at approximately eleven o'clock in the evening.

Mona ship information	
Comoros	Flag,
8516275	international
Moroni	number, port of
General cargo ship	registration, type
November 1985 / Germany	of ship, date and place of
Phoenix Register of Shipping	construction, classification, authority
iron	Construction
83.85 meters	type Overall length
3147	Gross tonnage Deadweight
3324 tons	motor power Name of
1360 kW	registered owner
(5562077) LTD SHIPPING FAREEDA	
Island Flag Shipping LLC (5437281)	ISM Technical Director Asm

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**The master and first officer**

Since loading the ship and calculating its balance are the responsibility of both the captain and the ship's first officer, the focus was on their discussion to obtain all the information that would help in determining the causes of the ship's capsizing. However, at the same time, the Authority's investigators were not able to view any testimonies or Experiences of the captain and first officer, given the loss of that

With the sunken ship and with these documents, have clarified the discussions

Both are as follows: with

1. On the date of the accident, the captain had spent about five and a half months on the ship.
2. The captain has been working with the company that owns the ship and on other ships belonging to it for about a year and a half general.
3. The captain has marine experience in various ranks on commercial ships estimated at about 20 years.
4. The captain had not previously loaded a full shipment of packed containers and on the date of the accident that was that type of cargo (loading the ship entirely with packed containers). His first time dealing with 5. On the date of the accident, the first officer had only spent about 20 days on the ship.
6. The first officer has experience and previously worked in the same rank on other ships for about a year Just.
7. The first officer has marine experience in various ranks on commercial ships for three years and a half.
8. The first officer had not previously loaded a full cargo of packed containers and on the date of the accident it was the first time entire ship with packed containers). he had dealt with this type of cargo (loading the

**The ship is Mona**

The Mona is a small class general cargo ship equipped so that it can load containers with the following distribution:

1. Three layers of containers below the roof at heights 02 - 04 - 06.
2. Two layers of containers on top of the roof (on the hatch covers) at heights 80-84.

**Technical analysis of the elements and facts of the accident and how it occurred**

**1. The ship Mina:**

- Although the Mona ship can load containers below deck three levels high, and by applying the simplest rules of ship balance calculations, it is preferable to load

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Heavy goods below the deck as much as possible, while lighter goods are placed on the deck of the ship in order to maintain their positive balance, especially with regard to containers. However, it appears that loading the bottom of the ship with only two layers of containers is due to the fact that these containers are heavy in weight (most of them exceed 30 tons). Which is why the floor of the lower wards (Top Tank) will not be able to bear weights of more than 60 kg

Ton (Weight Stack), according to which only two layers of containers under the roof were satisfied.

### **2. Balancing accounts:**

- It is clear from what happened to the ship of **tilting** when starting to load the second layer of containers on the roof that there was some defect in the process of calculating the ship's balance and that those calculations made by the first officer and approved by the captain were not accurate, especially since the double bottom balancing tanks were empty According to the statement of the captain and the first officer, which is not logical in the field of loading container ships, especially since loading on the deck is fast in terms of its stability, and the bottom balancing tanks should have been filled, not empty, in order to equalize the additional weights on the deck and maintain a positive balance of the ship, which is one of the issues intuitive art when dealing with such

shipments.

### **3. Synchronization of container loading and distribution:**

- It is evident from what is stated in the actual loading record that the loading officials at the port have maintained at all times the distribution of the shipment on both sides of the ship in an appropriate and equal distribution of weights throughout the period of loading work and on both sides of the ship.

### **4. How the accident occurred from a technical point of view and according to the sequence of**

**events** A. When starting to load the packed containers on the deck (top of the hold covers) and in the first layer (82), a decrease in the balance of the ship began due to the movement of its center of gravity (G) upwards in the direction of the added weights on top of the deck (containers).



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B. Upon completion of the loading of the packed containers on the deck of the ship in the first layer (82), the situation developed and the ship's balance became in a critical situation, as the ship's center of gravity (G) continued to move upwards until it became completely close to its oscillation center (Metacentric).

Which is called (M) for short.

T. With the continuation of the loading operations on the upper deck of the ship and in the second layer (84) starting from the left side of the ship and in the absence of adding any weights at the bottom of the ship (balancing water in the double bottom tanks), the center of the ship's gravity continued to move upward towards the weights added at the top of the deck until it coincided with the center of the ship. The ship swung and became in an unbalanced state, she did not lean to the left side because her ropes were holding her from the right side.

w. At 17:47, when two containers were added to the right side of the ship at locations 02-03-84 and 10-05-82, this was an external force that affected the unbalanced ship by adding weight on the right side, in addition to the effect of those added weights on increasing An increase in the ship's center of gravity, causing the ship to tilt on its side as a result of reaching the negative balance stage.

C. The ship continued to tilt to the right side until the degree of inclination reached about (5) degrees and stabilized in this position and did not return to the vertical position. Due to the change in the shape of the submerged part of the ship under water and the movement of the center of buoyancy (B) to the right in the direction of the inclination, the ship became stable in the position. LOL of Angle

And the captain noticed this matter (the inclination of the ship), which prompted him to request stopping the loading operations to verify the matter and try to correct it.

h. According to what came in the ship's actual loading record, the loading work stopped completely for about an hour and forty minutes, as the loading work resumed at 19:27, and according to the statement of the port administration and loading officials, when they returned, the ship was in the moderate (vertical) position, and it appears from that that the ship's captain has performed an action (correction).

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This will not happen, of course, except by adding an amount of balancing water to the high side (the left side). It appears from the sequence of events that the captain, due to his inexperience, was unable to estimate and determine the negative state of the ship's balance, and he partially used one of the upper water tanks on the left side. This is to quickly adjust the position of the ship and return it to the vertical position.

Kh. With the continuation of loading work on the upper deck of the ship in the second deck (84) and the captain's inability to correctly assess the state of balance of his ship due to his lack of experience and the failure to add any ballast water to the double bottom tanks, the ship returned once again to a state of unbalance as a result of the added weights above and the lack of the equivalent. Those weights were at the bottom of the ship, and at approximately eight o'clock in the evening, a number of (2) containers were added to the right side of the ship, which led to it tilting to the right again because it was unbalanced. However, this time the situation was worse, as the ship continued to tilt to the right side in a way. Larger, and attempts to unload the containers did not succeed in stopping this tilt because, in addition to the fact that the ship is unbalanced, the effect of the free surface of the amount of ballast water present in the tank, being partially full, led to the generation of a capsizing torque and a potential force that pushed the ship to continue to tilt until it completely capsized on its right side. .

**The main causes of the accident**

The main causes of the accident are due to many factors, as follows:

1. The shipowner uses a captain and first officer who do not have sufficient experience to load the ship with a type of cargo for the first time without previous experience in the field of container loading. It is known that this type of cargo requires qualified and experienced people in this field.
2. The absence of a reliable computer system for entering shipment data and obtaining information

Correct about the ship's state of balance.

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3. The lack of sufficient control over the ship by the country of registration or by its classification authority (both the flag and the classification authority are known to be indifferent to the technical condition of their ships).

4. The failure of the ship's captain or first officer to verify the true causes of the ship's tilt and to return

This is due to their lack of experience.

**Recommendations**

All of the following recommendations are to preserve the safety of ships, ports, and sailors, and are related to taking the necessary measures

to ensure that such accidents do not recur in the future. They are as follows:

1. Taking the necessary and sufficient measures to verify the efficiency of ship management companies

And those working in the country, including auditing their safety system (ISM).

2. Port administrations, upon loading the ships, shall obtain from the captain a copy of the ship's balance status after submitting the loading plan and the master or first officer conducting balance calculations.

Ship in advance and as planned for the load.

3. In the event of unforeseen issues occurring in the stability of the ship during the work of loading containers onto ships and the existence of any doubts with the port administrations, the matter must be escalated to the technical authority in the port and the

loading should not be started again until after actual verification of the causes of the problem and its definitive solution.

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This report was prepared by the Maritime Accidents Investigation Committee of the Federal  
Transport Authority, Land and Maritime

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