UEIM Transport Safety Investigation Center

MARINE SAFETY INVESTIGATION REPORT

OWNER/IMO NO : İLHAN YILMAZ 5/ 9892638

FLAG : Türkiye

LOCATION OF ACCIDENT: Nouadhibou/MORİTANYA

DATE OF ACCIDENT : 26.11.2019/13:00 Lt

FATALITY/INJURY : -/-

DAMAGE/POLLUTION : Total Lost

Board Decision No: 05/D-02/2021	*Date: 15/03/2021*

The sole purpose of this investigation is to make recommendations in order to prevent similar accidents and incidents within the framework of the legislation of the Transport Safety Investigation Center.

This report shall be inadmissible in any judicial or administrative proceedings whose purpose is to

LEGAL BASIS

This marine accident was investigated in accordance with the By-law on the Investigation of Marine Accidents and Incidents which came into force after being published at the Official Gazette No.29056 on 10th July 2014.

Investigation procedures and principles are further applied by considering Resolutions of International Maritime Organization concerning International Standards and Recommended Applications for Safety Investigations Directed to MSC 255(84) (Casualty Investigation Code) and Resolution A.1075(28) Marine Accidents or Incidents, and European Union Directive 2009/18/EC.

FIGURE LİST

ABBREVIATION AND DEFINITIONS

IMO : International Maritime Organization

ILO : International Labour Organization

FSM : Free Surface Moment

SOURCE OF INFORMATION VE REFERANCE LIST

- Ship Master and Ship's Crew
- Document of Ship's Company
- Document of Class Society

SUMMARY

Image 1: Accident Location

Note: All times used in the report are local time coordinated with GMT

Following the fishing activity in Al Masida (at the fishing place) of Mauritania, fishing vessel, M/V İLHAN YILMAZ 5 that sailed to Nouadhibou with a cargo of approximately 60 tons of fish, took water in and sank at $20^0\ 12'$ North $017^0\ 20'$ West location in the southwest direction (at bearing 207^0) from the breakwater of Nouadhibou, 32 miles off the shore on 26th November 2019, at 13.00.

Bad weather and sea conditions were developed as the prevailing north wind came across with the westward current at the accident location. Irregular and less periodical high waves were developed as the wave height rose at the location where the Northern winds and the westward current combined. Therefore, the boat fell more frequently between the waves. The vessel, which struggled with irregular waves at shorter periods, took an excessive amount of sea water onto its deck. Since the fish holds and the accommodation hatches were also open, the fish hold and the accommodation flooded with the water coming to the deck.

The vessel sank due to taking in an excessive amount of sea water. All of the vessel's crew were rescued by the surrounding fishermen while the boat was afloat.

No reports were issued on post-accident sea pollution.

As a result of the investigations, the vessel lost stability and sank as the water flooded into the fish hold and the accommodation whose hatches were open at the bad weather and sea conditions.

As a result of the marine accident investigation, recommendations were made to the Ship's Operator, Maritime Administration, Chambers of Shipping and related govermental administrations

SECTION 1 - FINDINGS

1.1 Information on the Vessel

İLHAN YILMAZ 5

Flag	Turkish Flag
Class Society	Turkish Lloyd (Hull Section)
IMO Number	9892638
Type	Fishing Vessel
Place and Year of Building	Karadeniz Ereğli, 2019
Gross Tonnage	397 GT
Length Over All	27,9 meters
Main Engine and Its Power	Two S12A2-T2MPTK Main Engine/ 2X 858kW

1.2 Information on Vessel Navigation

İLHAN YIMAZ 5

Port of Departure	Nouadhibou (fishing off the Port of Nouadhibou)
Port of Arrival	Nouadhibou/Mauritania
Cargo Information	60 Tons of fish
Number of Person	17
Minimum Number of Crew	4
Type of Navigation	Near Coastal Voyage

1.3 Information on Accident

Date/Time of Accident	26 November 2019 Time: 13:00
Accident Type (IMO)	Very Serious Marine Accident
Type of Accident	Sinking
Location of Accident	32 miles off the Port of Nouadhibou/Mauritania
Casualties	-/ - /-
Damage	Total Lost
Pollution	Not reported

1.4 Information on Environment Conditions

Wind	20 Knots from North
Sea Condition	Wave Height 2-2,5 meters
Visibility	Good Visibility
Weather Condition	Cloudy

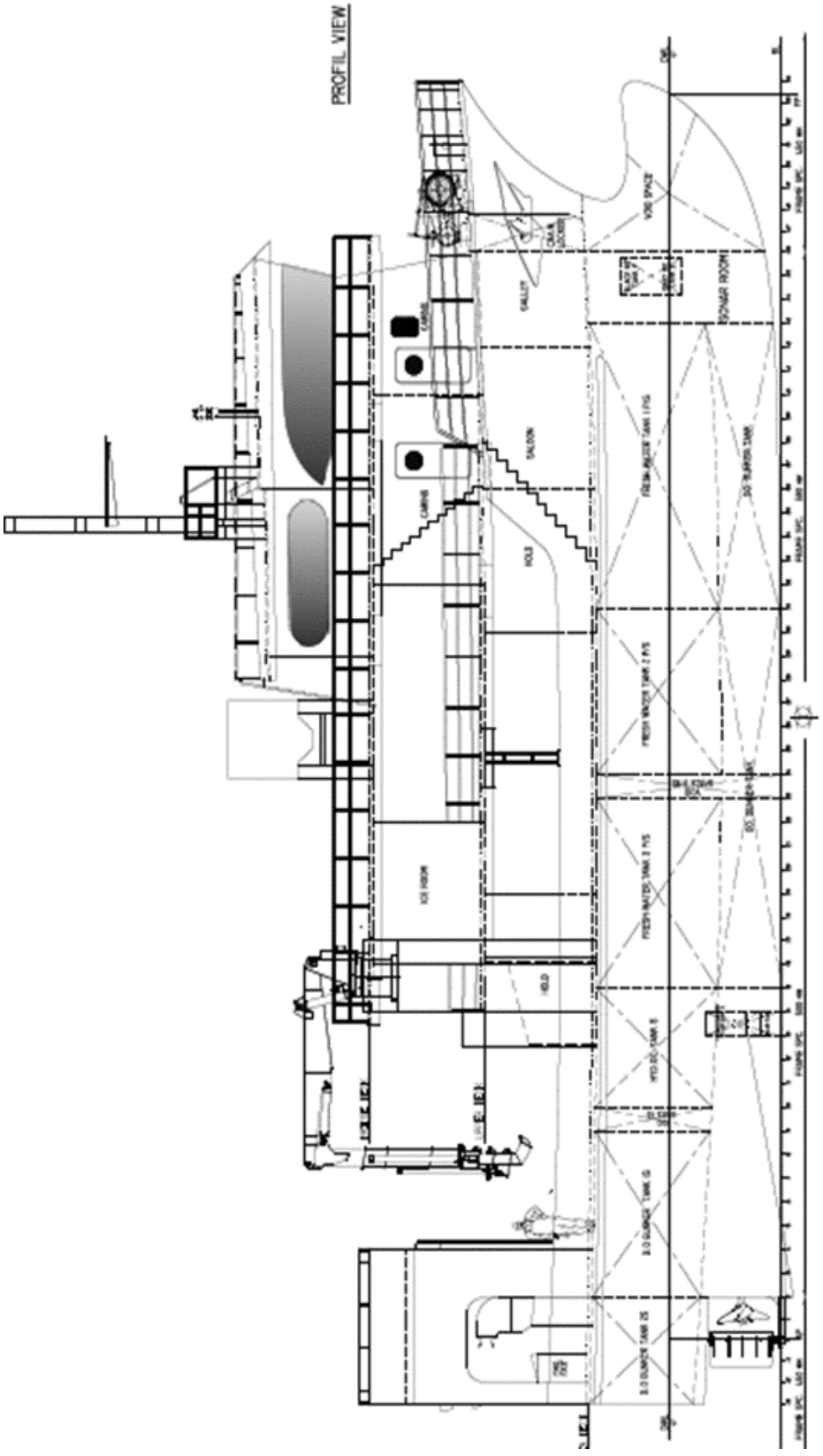
1.5 Other Information on the Vessel

1.5.1 General Structural Specifications

The vessel, M/V İlhan Yılmaz 5 is a 397 Grt fishing vessel, which was equipped with fishing gear. The hull of the vessel was built in the Karadeniz Ereğlisi Shipyard in 2019 under Turkish Lloyd class. The registered length overall of the vessel is 24.33 m, the beam mould is 12 m and the mould depth is 4.16 m.

There are two fish holds and four hatches in total; each hold has two hatches (at sizes of 100 cm x 100 cm).

The vessel is equipped with two diesel main engines, each having 858 kW power, and two propellers. The fore draught of the vessel is 150 cm, aft draught is 200 cm and the vessel is trimmed by the stern for 50 cm while in ballast.



Profile View of the Hull

1.5.2 Flag State Surveys

Following the submission of the following plans and projects, the relevant port authority permitted the hull to be built on 13.03.2018.

- General Plan
- Drawing Line Plan
- Midship Section
- Longitudinal Section and Decks
- Shell Plating
- Bulkheads
- Non-Destructive Test Plan
- Tank Test Plan
- Welding Plan

In the controls of the plans mentioned above, it was stated in the plan control, declared by the Class society on 09.07.2019, that the Flag state approved that the hull was built under the supervision of the Class society and conformed to the Class rules based on the approved projects and the surveys conducted. Additionally, it was recommended that the holes on the watertight bulkhead must be equipped with watertight doors.

The dock survey of the hull, based on the issuance of seaworthiness certificate, was completed on 11.07.2019; the construction structure, plate thickness measures, propeller, and shafts and the hull was inspected in the dock survey and the vessel was stated to be free from any problems for launching.

The sea survey was completed on 25th August 2019 after the navigational aids, nautical publications, life-saving appliances, fire protection equipment, main and auxiliary engines were inspected in Istanbul Port area

For the issuance of a seaworthiness certificate, the vessel is determined to be suitable for the service to which it is allocated by conducting dock and sea surveys.

Those surveys are conducted for the publication of the first five-year certification or the publication of the new five-year certification due to expiration and based on the inspection

of vessel's keel, structure, **the watertight compartment and ability of the vessel's stability, the strength and water tightness**, the conformity of engines and equipment, the conformity of freeboard and load lines, the conformity of structural fire safety and fire compartments, the conformity of bulwark and deck railing systems and drainage systems of liquid, the conformity to the prevention of sea pollution, the conformity of sheltering and accommodation onboard, the conformity of auxiliary engine, rudder equipment, electrical wiring and systems, fire protection, fire detection and fire extinguishing systems, the conformity of life-saving appliances, their deployment and lowering systems, the conformity of navigational equipment, navigation lights and signs and **communication tools**, the conformity of vessel's anchoring and mooring equipment, the conformity of loading equipment, the compliance with emergency regulations, publications, manuals and instructions.

The Certificate of Seaworthiness was seen to be issued on 27.08.2019.

Image 2: View of the vessel, İlhan Yılmaz 5 from port side

1.6 Development of the Accident

After completing its fishing operations on 26th November 2019 at 10.00 off the Port of Nouadhibou, the Turkish flagged vessel, İLHAN YILMAZ 5, sailed to transport its 60 MT fish cargo to the said port. The crew went to the dining hall for lunch at approx. 32 NM from the breakwater of the port at around 13.00. A strong wave suddenly hit the vessel when the crew was in the lounge and the seawater flooded into the open fish tanks and accommodation. As the wave suddenly flooded the accommodation, the crew was shocked, a second wave also hit the vessel before the crew got out of shock and the vessel listed and started to sink by the impact of the water. The captain instructed the crew to pump out the water that was intruded into the fish holds. The crew prepared the pumps to drain out the water but failed to pump due to excessive water intrusion into the fish holds.

1.7 Post-Accident Events

Despite the efforts of the captain and crew, they failed to save the vessel and asked for help from the nearby vessels and the coast guard. The fishing boat MİREM-1, the closest (approximately 8 nautical miles from the accident site) one among the Turkish fishing boats sailing around, arrived at the accident site for help.

Due to the heavy flood in the fish hold, accommodation and the engine room, the crew headed for the rescue boat to abandon the vessel. After the crew boarded the rescue boat, they moved away from the vessel. The vessel sank in about five minutes. All 25 crew members, including eight Mauritanians and 17 Turks, were taken to the fishing boat, MİREM-1 after the accident and brought to the port on 27th November 2019 at 01.00. No one was killed or injured in the accident. No reports were issued on pollution.

Image 3: Sinking of İlhan YILMAZ-5

Image 4: View of The Vessel at The Time of Sinking

1.8 Manning of the Vessel

The vessel, İLHAN YILMAZ-5 was manned with several seamen, as indicated in the Minimum Safe Manning Certificate, issued by the flag state. On the day of the accident, there were 25 person on board, including the captain. At the time of the accident, the Captain was on the bridge and other crew members were at the accommodation for lunch.

The Minimum Safe Manning Certificate, issued by the flag state, stipulates four crew members.

The working language of the Turkish crew on board was Turkish and Mauritanian seamen spoke Arabic.

The vessel's captain is 43 years old and has been serving as a seaman on fishing boats and yachts since 1987. He has been working for the company for three years, including eight-month on that boat. He has been working on fishing vessels in Mauritania territorial waters for nearly 3.5 years since June 2016.

Certificate of competency, stating that he can work as a Restricted Watchkeeping Officer, was issued on 31.07.2019. Restricted GMDSS Radio Operator's License (ROC) was issued on 31.07.2019.

The seaman is 21 years old and got his certificate of competency on 15.11.2017, he has been serving as a first officer on board.

The certificates of competency belong to the other two crew members were seen to be valid.

1.9 Information on Environmental Conditions

The weather was very cloudy and the visibility was clear. The wind blustered from the North and caused waves up to 2-2.5 m height on the sea.

SECTION 2– EVALUATION

2.1 Purpose

This marine safety investigation aims to make recommendations for the prevention of similar potential marine accidents or incidents by identifying the circumstances and safety factors of accidents.

2.2 Probable Cause of the Accident

The probable cause of the accident is that the hatches of the fish holds and the accommodation remained open, the seawater intruded into the fish holds and thereby the fish inside the hold created the free surface moment and destabilized the vessel.

2.3 Evaluation of Environmental Conditions

The seawater temperature was 16-17 degrees Celsius and rise to 20-21 degrees Celsius with Gulf Stream.

There is a tide in the region and a current was formed westward during the ebb of water and the wave height occasionally rose with the northward gale that impacted this current. Although the wave period is shortened at the location where the current came across with the northward wind to which it ran vertically, the wave height rose to 5-6 meters.

The vessel was exposed to hard and more frequent strong ocean waves due to risen wave height and shortened wave periods. The vessel was destabilized as a result of the flood caused by the water through the deck holes that were forgotten open and excessive amount of water intrusion.

2.4 Evaluation of the Accident in Terms of Loading Condition and Stability Loss

2.4.1 Planning Loading Operations[1]

The hull of the vessel was built under the Accredited Class Rules. There are two fish holds of 70 tons on the stem and two fish holds of 30 tons from the midship towards the stern. The total capacity of the fish holds on the stem is 140 tons and about half of these holds were filled with 60 tons of fish and the other half was empty. The vessel sailed as the hatch covers of the fish holds on the stem, accommodation doors and the engine room hatches open due to high temperature in the navigation zone and exposed to high waves.

The stem of the vessel submerged as a result that the high waves hit the stem of the vessel in lower periods.

As the stem of the vessel submerged, the water heavily intruded through the open hatches on the stem, respectively, fish holds, accommodation and the engine room.

In consequence of heavy water intrusion, bulk cargo shifted forward and this had negatively affected the stability of the vessel and caused the vessel to be trimmed by the head.

Keeping the hatches of fish holds, the accommodation and the engine room open in adverse weather and sea conditions as well as continuing to sail with a half-loaded cargo in the fish hold no. 1 that is riskier for stability instead of fish tank no 2 that is safer for stability posed a potential risk to the vessel's safe navigation.

[1] The loading status were evaluated based on the captain's statement.

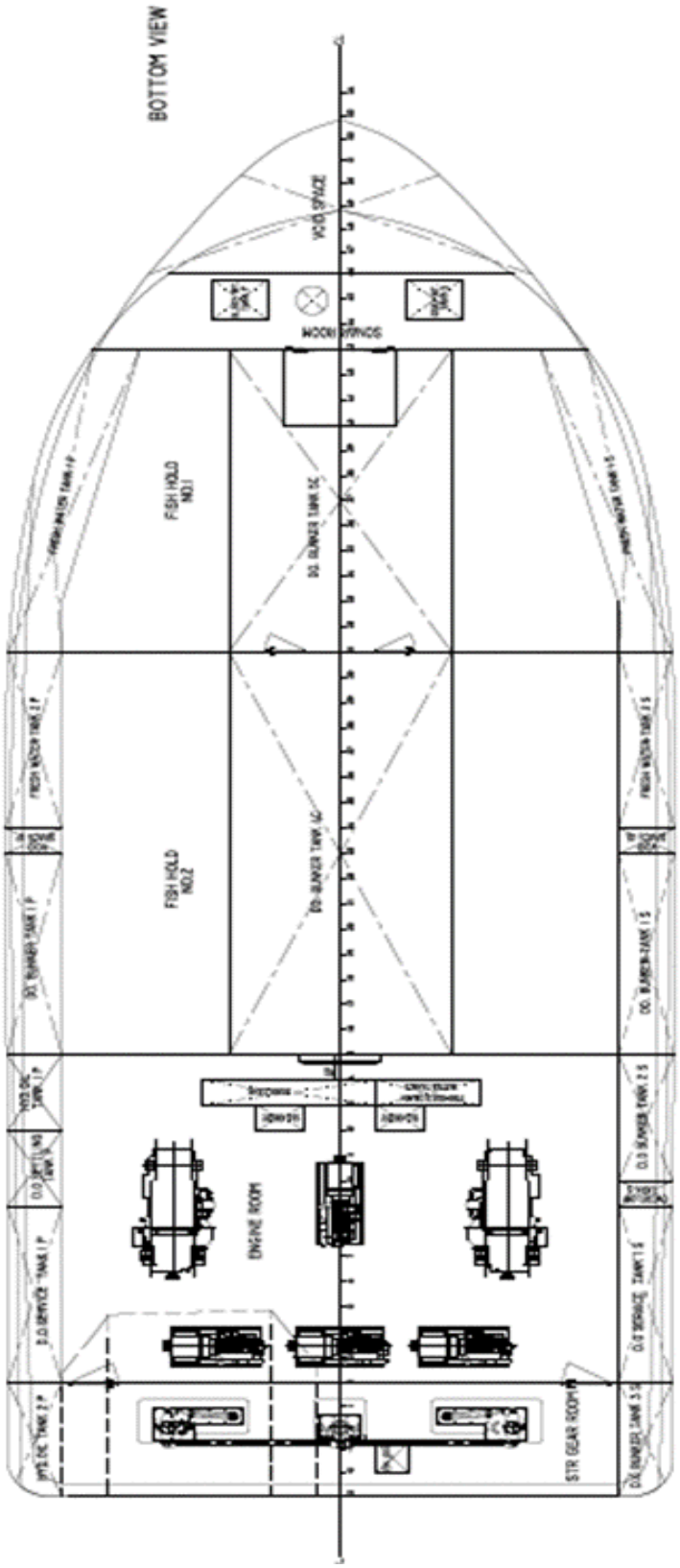


Image 5: Bottom Tank Plan of the Vessel

The foregoing risk actions indicate that the captain didn't have sufficient knowledge that the effect of different loading conditions on the stability of the vessel and the free surface moment due to the empty tnaks and holds may result in loss of stability.

In the wake of the investigation, nothing proved that the Captain had sufficient knowledge on the ability of the vessel's stability at each loading condition and the maximum fish carrying capacity of the vessel.

2.4.2 Evaluation in Terms of Stability Loss

The free movement of the bulk fish cargo inside the hold was due to the presence of the cargo inside the hold in bulk and the interaction of bulk fish cargo with the heavy water that intruded into the hold.

The water and fish in the holds of the vessel that was exposed to heavy waves started to move by creating a free surface moment on the vessel. The water and fish that moved freely inside the hold created a free surface moment and caused the vessel to be destabilized. The stem height of the destabilized vessel decreased, the vessel trimmed by the head and the water flooded into the fish holds, accommodation and the engine room, respectively, in a short span of time.

The crew tried to drain out the heavy seawater that was accumulated inside the fish holds through the portable and fixed pumps, but the amount of seawater that intruded into the holds was over the capacity of the pumps to drain the seawater out, they failed to do so and they also couldn't prevent the subsequent water intrusions due to the lost trimming of the vessel. Rapid water intrusion into the vessel led the crew towards the rescue boat on the aft. Launching the rescue boat that was located at the endpoint of the sternpost caused the vessel, trimmed by the head, to be trimmed further by the head and made it easy for the vessel to take water in through the foreside and to sink. Besides, setting the engine full speed ahead also expedited the vessel, trimmed by the head, to sink.

To prevent the stability loss in consequence of endangering the buoyancy of the vessel and the trim of the vessel by the head in case of any damage to or filling water into the large fish holds, it's safer to locate large fish holds on the aft side instead of the foreside.

Locating the hatches and the holes on the aft side and close to the centreline due to the exposure of the vessel’s stem to heavy waves is a safer condition for its seaworthiness to prevent the vessel from taking in water.

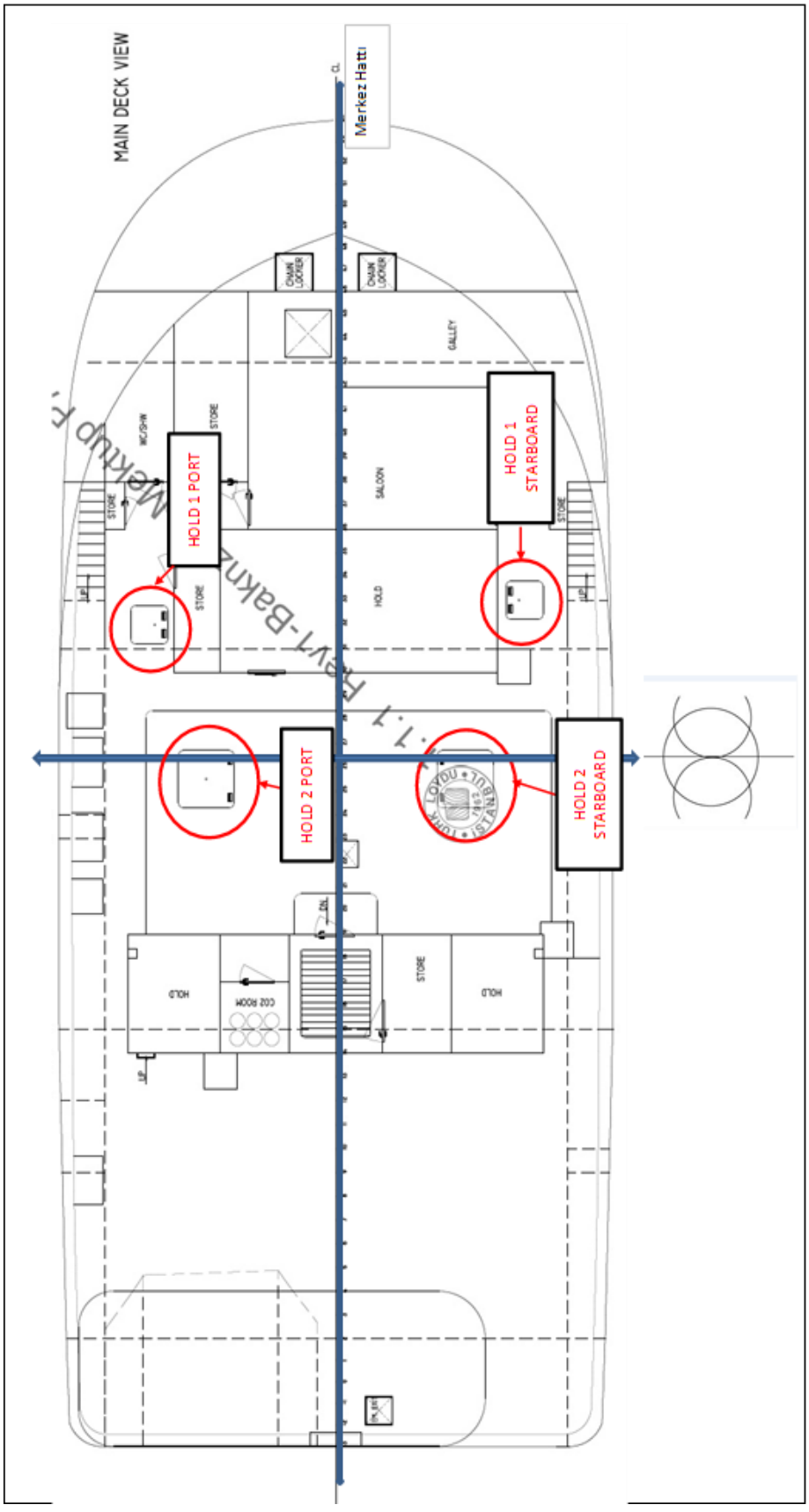


Image 6: Main Deck Plan of the Vessel

2.5 Fatigue

The Minimum Safe Manning Certificate, issued by the maritime administration, approves one (1) Captain and two Deck Crews on board at near-coastal voyage. No officer is stipulated to take over the navigational/port watch after the Captain.

Article 26 of the Maritime Labour Law regulates the working hour of the watchkeeping crew as 8 hours and the Section A-VIII/l of the STCW Code states that the watchkeeping crew shall be provided with a minimum of 10 hours of rest in any 24 hours.

In this case, as the navigational and fishing activities continued for 24 hours, the working and resting hours of the captain are unlikely to comply with the requirements of national legislation and the STCW convention.

The records obtained and the statements of the key personnel involved in the accident indicate that fatigue was among the factors affecting the accident. The fact that the vessel continued its navigational and fishing activities for 24 hours, the Captain was also left alone in keeping both the navigational and port watch and assumed the existing workload is considered to have caused severe physical and mental fatigue.

2.6 Evaluation for Manning of the Vessel

The Flag State issued the Minimum Safe Manning Certificate for Near Coastal Voyage under SOLAS-74 (as amended) Rule V/14.2.2 and by taking into account the principles set out in Res. A 1047 (27).

Examining the voyage zone of the vessel, the Istanbul-Mauritania voyage was approximately 3150 NM and this distance is observed to be within the Near Coastal Voyage zone, permitted by the Minimum Safe Manning Certificate.

Probably in the best conditions, the vessel that sailed from Istanbul with an average of 10 NM, can reach the fishing area barely in about 13 days. At this stage, it is understood that the captain kept the navigation shift alone for about 13 days as 24 hours. This leads to excessive mental and physical fatigue in the captain and thus it is not possible to carry out safe navigation and fishing activities on board. On the other hand, since the captain was also

alone in the Mauritania fishing process, this resulted in operational deficiencies in fishing, navigation and emergency response activities.

The watchkeeping, working and resting hours are considered unlikely to comply with the rules set by the IMO and ILO organizations for safe fishing activities with one (1) Captain and two (2) deck crew on board.

Examining the principles set out in Res. A 1047 (27), Article 3.1 includes the following requirements.

- *Maintaining safe navigational, port, engineering and radio watch uninterruptedly under Regulation VIII/2 of the 1978 STCW Convention,*
- *Mooring and unmooring the vessel safely,*
- *Ensuring safe carriage of cargo,*
- *Providing for sufficient medical care on board,*
- *Responding to emergencies on board.*

The same document Annex-3 describes the responsibilities of the Ship Operator in Manning and the approval processes and principles for Maritime Administration.

The following principles are included in the responsibilities of the Ship Operator in Manning.

1. *Assessing the tasks, duties and responsibilities, required for the safe operation, the safety of the vessel, for protection of the marine environment, and for responding to emergencies*
2. *Displaying that the provisions for working hours have complied*
3. *Submitting the assessment on manning of the Vessel with sufficient number and capacities of personnel, including its safe operations and responses to the emergencies by the Ship Operator to the Maritime Administration,*
4. *Informing the Maritime Administration in the case of changes in voyage zone, structure, and engine, maintenance requirements of the vessel, which may affect the safe manning.*

The principles on the approval processes for Maritime Administration in Annex-3 are as follows.

- *Ensuring that the vessel is manned with a sufficient number and capacities of personnel to fulfil the tasks, duties and responsibilities set out including its safe operations and responses to emergencies.*
- *Ensuring that the captain, officers and other crew members of the vessel are not required to work more hours than is safe in relation to the performance of their duties and the safety of the vessel and that the requirements for working and resting hours, in accordance with applicable national regulations, can be complied with*

In applying such principles, Maritime Administrations should take proper account of existing IMO and ILO instruments in-force that deal with

a. Watchkeeping
b. Working and Resting Hours
c. Safe Ship Management
d. Certification of Seamen
e. Training of Seamen
f. Occupational safety, health and hygiene
g. Crew accommodation and food
h. Security
i. Radiocommunications.

The vessel operator should submit its assessment for manning sufficient number and capacities of personnel onboard based on the foregoing principles and criteria and the Maritime Administration should approve it based on the foregoing requirements.

In the wake of the information and documents obtained and the discussions, there is no evidence that the vessel operator made an assessment based on the foregoing principles and criteria and thereafter submitted those matters to the Maritime Administration.

2.7 Evaluation of the Captain's Training

It was seen that the Captain has received the following training.

- Proficiency in using life-saving appliances
- Personal Life Saving Techniques at Sea

- Crew Safety and Social Responsibility Training
- Basic First Aid Training
- Fire Prevention and Fire Fighting Training
- Advanced training on fire fighting
- Radar monitoring and plotting training
- Training on Keeping Navigational Watch
- Safety Officer

It is understood that the Captain has received the training required to obtain STCW requirements. However, there is no evidence that the applied muster drills that increase emergency response efficiency were practised.

On the other hand, keeping the hatches of fish tanks, the accommodation and the engine room open in adverse weather and sea conditions as well as continuing to sail with a half-loaded cargo in the fish tank no 1, which is riskier for stability, instead of fish tank no 2, which is safer for stability, posed a potential risk to the vessel's safe navigation.

It is found that the safe cargo carrying capacity of the vessel, the stability values of the vessel at different loading conditions and the freeboard and stability, providing information to the Captain in emergencies, for instance, in case of any damage to the vessel, were not assessed.

In the wake of the investigation, nothing proved that the Captain had sufficient knowledge of the ability of the vessel's stability at each loading condition and the actual fish carrying capacity of the vessel.

SECTION 3 – RESULTS

The findings and safety factors are not listed in any order of priority.

3.1 Primary Safety Factor

The vessel was exposed to hard and more frequent strong ocean waves due to risen wave height and shortened wave periods. The vessel was destabilized and sank due to the flood caused by the water through the deck holes that were forgotten open.

3.2 Indirect and Other Safety Factors that Caused the Accident

1. The whole hold 1 (approximately 140 tons) and about half of hold 2 (30 tons) were located in front of the midship section and it appeared that when the vessel was fully loaded (200 tons) it would considerably be trimmed by the head and adversely affect the vessel stability. The holds were designed to be trimmed by the head without taking the vessel trim and longitudinal stability into account.

2. It appeared that the hatches and holes on the stem and the ports close to the side increased the risk of water intrusion and weakened the ability of the vessel's stability due to the exposure of the vessel's stem to heavy waves.

3. The free movement of bulk fish cargo inside the hold resulted in the loss of stability as a result of the interaction of cargo with the heavy water that intruded into the tank.

4. The Minimum Safe Manning Certificate, issued by the maritime administration, approves one (1) Captain and two Deck Crews on board at near-coastal voyage. No officer is stipulated to take over the navigational/port watch after the Captain.

5. The fact that the vessel continued its navigational and fishing activities for 24 hours, the Captain was also left alone in keeping both the navigational and port watch and assumed the existing workload is considered to have caused severe physical and mental fatigue.

6. As the stem of the vessel submerged, the water heavily intruded through the open hatches on the stem, respectively, fish holds, accommodation and the engine room.

7. It is found that the Captain had no sufficient knowledge that the effect of different loading conditions on the stability of the vessel and the free surface moment due to the empty tanks and holds may result in loss of stability.

8. Launching the rescue boat that was located at the endpoint of the sternpost put the vessel, trimmed by the head, into a worse position and made it easy for the vessel to take water in through the foreside and to sink. Also, setting the engine full speed ahead expedited the vessel, trimmed by the head, to sink.

9. The cargo was loaded in the largest tank no. 1, which has the greatest Free Surface Moment, instead of tank no. 2, which is the most eligible for stability and has the lowest Free Surface Moment. The increased trim by the head through the water intrusion into the Tank no.1 and the loss of stability due to FSM raised the risk of a vessel sinking.

10. It is understood that the crew who involved in other fishing activities were not trained on the topics related to responding to emergencies, such as using life-saving appliances, personal lifesaving techniques at sea, crew safety and social responsibility, fire prevention and firefighting, etc.

11. Individual actions of the crew instead of making an effort to save the vessel as a team put forth that the emergency training and muster drills were not adequate and effective.

SECTION 4 – RECOMMENDATIONS

The following recommendations are made by considering the analysis and conclusions derived from the accident investigation.

To the Maritime Administration

5/02-21 Regulating for improvement of capacity and number of manning the fishing vessels in a way to avoid fatigue by considering the voyage zones, the resting hours of the seamen, the watch arrangements and fishing activities based on the Marine Labour Law and STCW Code,

6/02-21 Inspecting to see whether the emergency drills, required to be held periodically, are practised or not

To the Ship Operator

7/02-21 Ensuring that the captain is trained in vessel stability,

8/02-21 Equipping the outer holes of the deck with proper covers to prevent sudden floods,

9/02-21 Taking precautions to keep the watertight hatches on the deck closed during the navigation,

10/02-21 Practising regular muster drills on the abandonment of the ship and the responses to the emergencies,

To the Ministry of Family, Labour and Social Services

11/02-21 Effectively inspecting that the crew, working on fishing vessels, are trained and certified in the occupational health and safety suitable for the work they do,

To the Ministry of Agriculture and Forestry

12/02-21 Regulating the Aquaculture Statute that the natural persons who will get the Aquaculture License must be trained and certified on profession, health and safety.

To Maritime Chambers

13/02-21 Announcing the report to your members to minimize or prevent similar accidents,