



# SAFETY INVESTIGATION REPORT

202306/010

REPORT NO.: 06/2024

June 2024

The Merchant Shipping (Accident and Incident Safety Investigation) Regulations, 2011 prescribe that the sole objective of marine safety investigations carried out in accordance with the regulations, including analysis, conclusions, and recommendations, which either result from them or are part of the process thereof, shall be the prevention of future marine accidents and incidents through the ascertainment of causes, contributing factors and circumstances.

Moreover, it is not the purpose of marine safety investigations carried out in accordance with these regulations to apportion blame or determine civil and criminal liabilities.

#### NOTE

This report is not written with litigation in mind and pursuant to Regulation 13(7) of the Merchant Shipping (Accident and Incident Safety Investigation) Regulations, 2011, shall be inadmissible in any judicial proceedings whose purpose or one of whose purposes is to attribute or apportion liability or blame, unless, under prescribed conditions, a Court determines otherwise.

The report may therefore be misleading if used for purposes other than the promulgation of safety lessons.

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## MV DOGAN

**Serious injury to a crew member while operating the vessel's lathe, in position 47° 21.1' N 006° 25.8' W 07 June 2023**

### SUMMARY

Whilst on passage from the port of Antwerp, Belgium, the fitter had just fabricated a securing pin for an anchor cable stopper.

Using a hand file to smoothen the surface of the nearly completed pin, which was mounted on the vessel's lathe, his right hand suddenly slipped off the pin. The coveralls' sleeve got caught in the rough surface of the pin and his right hand was pulled around the pin, towards the chuck.

Crew members in the vicinity reacted quickly and stopped the lathe to free the fitter's hand.

However, the fifth digit of the fitter's right hand could not be saved, and the fitter was eventually air lifted to a shore hospital.

The safety investigation concluded that the manner in which the fitter was gripping the file, while carrying out the task, led to his injuries.

Taking into consideration the safety actions taken by the Company, no recommendations have been made by the MSIU.



## FACTUAL INFORMATION

*Dogan* (**Figure 1**) was a 23,638 gt bulk carrier, owned by SPDBFL No. One Hundred and Ninety-Two (Shanghai) Ship Leasing Co. Ltd., and managed by Ciner Gemi Acente Isletmeleri Sanayi ve Tic. A.S., Türkiye (Company). The vessel was built by SPP Shipbuilding Co. Ltd., Republic of Korea, in 2013. American Bureau of Shipping (ABS) acted as the classification society as well as the recognized organization, in terms of the International Safety Management Code, for the vessel.

*Dogan* had a length overall of 188.00 m, a moulded breadth of 30.00 m, and a moulded depth of 14.70 m. The vessel had a summer draft of 9.916 m, which corresponded to a summer deadweight of 35,173 metric tonnes (mt).

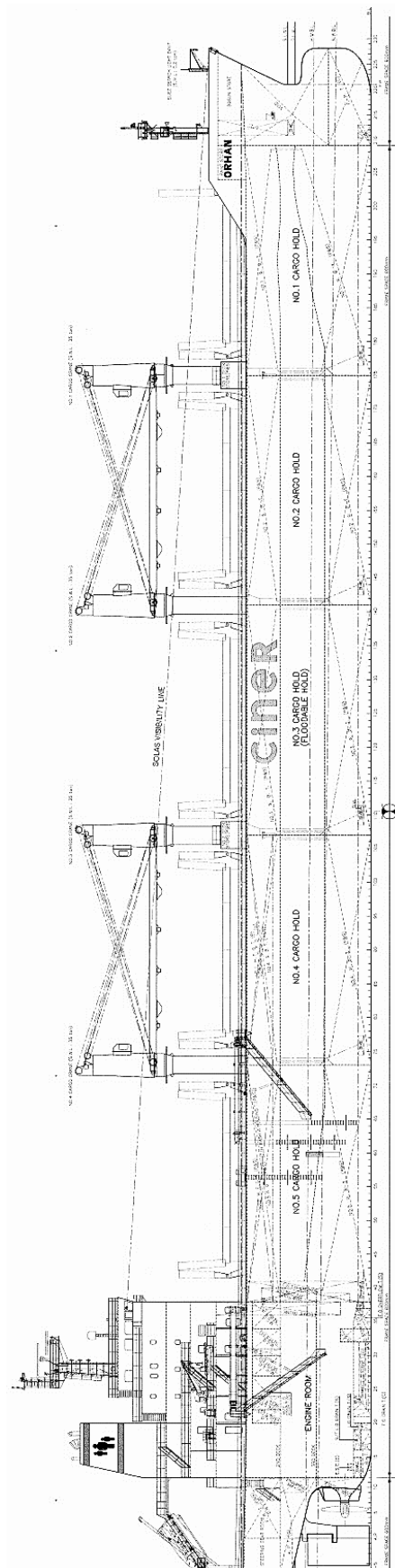
Propulsive power was provided by a 6-cylinder, two-stroke, single-acting, slow speed, MAN B&W 6S46MC-C marine diesel engine, which produced 6,700 kW of power at 115 rpm. This drove a fixed-pitch propeller, enabling *Dogan* to reach a service speed of 14 knots.

At the time of the occurrence, *Dogan* was loaded with 32,054.8 mt of soda ash, drawing a forward draught of 8.45 m and an aft draught of 10.51 m.

### Crew

The Minimum Safe Manning Certificate of *Dogan* prescribed a crew of 14<sup>1</sup>. At the time of the occurrence, there were 19 crew members on board, all of whom were Filipino nationals.

<sup>1</sup> Provided that the unmanned machinery space (UMS) and the bridge control systems were operational, and at least two deck officers held Global Maritime Distress and Safety System (GMDSS) General Operator's Certificates.

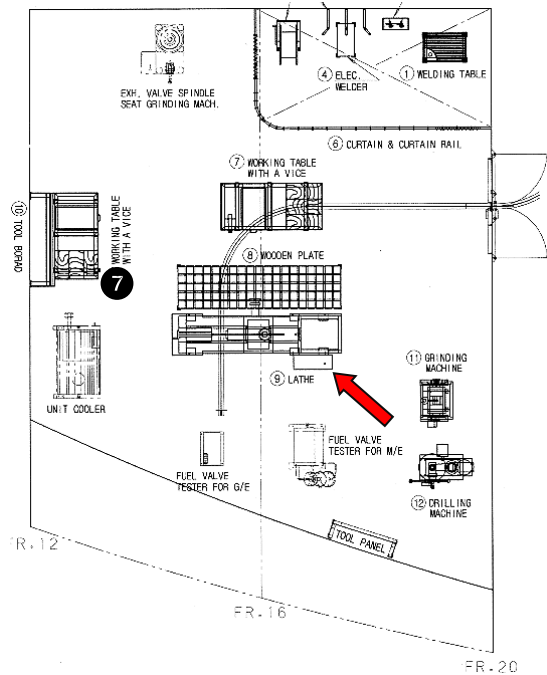


**Figure 1: Extract of MV *Dogan*'s General Arrangement plan**

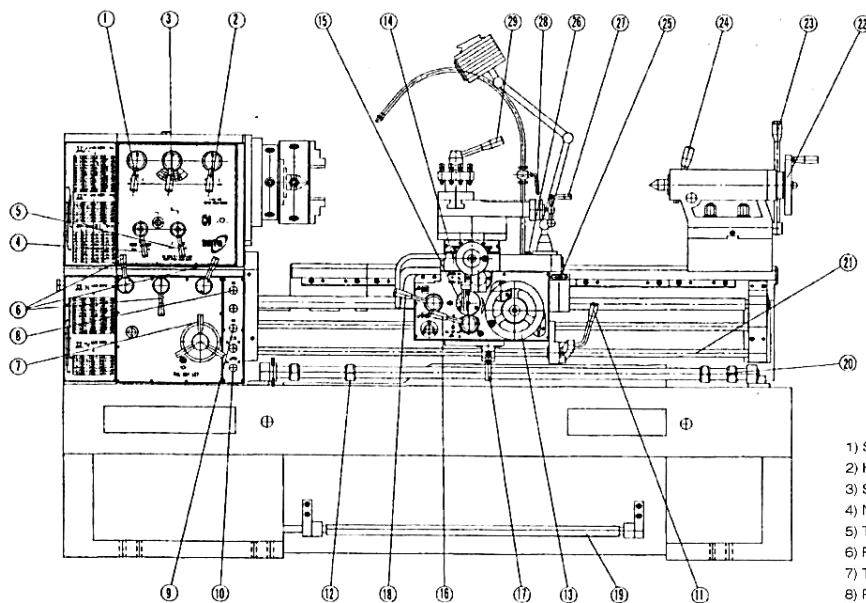
The seriously injured fitter was 38 years old. He had about 12 years of seafaring experience, three of which were served in the rank of a fitter. He had served with the Company for two years in this rank, prior to the occurrence. He held STCW<sup>2</sup> III/5 qualifications for an able seafarer – engine. His certificate of proficiency was issued by the Maritime Industry Authority (MARINA), the Philippines, in 2015. Additionally, he had completed training for shielded metal arc welding, oxygen and gas welding, and a lathe machine operator, in 2018. The fitter had joined *Dogan* on 28 October 2022, at the port of Derince, Türkiye.

### The lathe

The vessel's lathe (**Figure 2**) was a DMTG CDL6246/1000 model, fitted in the engine-room's workshop<sup>3</sup> (**Figure 3**).



**Figure 3: Extract of a plan showing MV *Dogan*'s engine-room workshop arrangement**



**Figure 2: The lathe**

<sup>2</sup> IMO. (2020). *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978* (Consolidated ed.). London: Author.

<sup>3</sup> The safety investigation was advised by the Company, based on information provided by the shipyard, that although the lathe's drawing was for a different model than the one installed on board, the features and operating controls were the same.

## Environment

The vessel's records indicated that around the time of this occurrence, the sky was clear, and the visibility was about eight nautical miles (nm). A strong breeze was blowing from the East Northeast and the sea state was recorded as 'rough', with a 3.0 m high East Northeasterly swell. The air and sea temperatures were recorded as 17 °C and 15 °C, respectively.

## Narrative<sup>4</sup>

*Dogan* departed from Alicante, Spain, on 02 June 2023 and was bound for Antwerp, Belgium to unload its cargo.

On the morning of 06 June, the fitter was assigned to fabricate a securing pin for one of the anchor cable stoppers, as the one in use was bent and was not fitting in its slots. The fitter took the measurements of the securing pin and cut a spare steel rod of that approximate diameter, to the required length<sup>5</sup>. He then placed the rod in the lathe to finish it to the exact dimensions. This task continued through the day, by the end of which, the rod was close to being finished.

On 07 June 2023, at 0800, the fitter reported for duty in the engine control room. A routine daily meeting was conducted, and the fitter was assigned to finish the work on the steel rod.

The fitter secured the steel rod in the lathe (**Figure 4**) and resumed the task. He used a fine cut hand file<sup>6</sup> to smoothen out the surface of the rod. The metal chuck guard was lowered into position, while the acrylic carriage guard was moved aside to allow for the filing of the rod.



**Figure 4:** The securing pin placed in the lathe

Several minutes later, he stopped the lathe and went to the forecabin to confirm the required dimensions. Returning to the workshop, the fitter started the lathe on a low-speed setting<sup>7</sup> and resumed filing the steel rod, holding the file with his right hand above the rod. Around this time, the second engineer and one of the oilers were also present in the workshop, engaged with different tasks at the workshop bench<sup>8</sup>.

At 0900, shortly after resuming the task, the fitter's right hand slipped lower and onto the steel rod. The right sleeve of his coveralls got caught in the rough surface of the rod<sup>9</sup>, and his hand was pulled around and towards the chuck (**Figure 6**).

As a result, the fitter suffered serious injuries to his right hand, while his body was quickly pulled onto the lathe in a manner that he was unable to (and did not have the time) to operate the lathe's foot brake (**Figure 7**).

<sup>4</sup> Unless otherwise specified, all times in this safety investigation report are local (LT = UTC + 2).

<sup>5</sup> The fitter stated that the length of the securing pin was about 15 inches, and its diameter was about 35 mm.

<sup>6</sup> The fitter recalled that the length of the hand file was about 12 to 15 inches, while its width was about 20 mm.

<sup>7</sup> The fitter could not recollect whether he had set the speed to 45 or 70.

<sup>8</sup> Item no. 7 in **Figure 2** (working table with a vice).

<sup>9</sup> Achieving a rough surface after machining the rod on the lathe may be indicative of a tool which would require sharpening before it is used again.





**Figure 6: Simulation of the accident, showing how the fitter's hand was pulled towards the chuck**



**Figure 7: Simulation of the accident, showing how the fitter's body was pulled into the lathe**

The fitter called for help and the second engineer and oiler immediately responded. The second engineer pressed the emergency stop button (**Figure 7**), and then assisted the oiler in freeing the fitter's hand from the lathe. It was noticed that the fifth digit of the fitter's right hand was amputated.

The two crew members then helped the injured fitter to the vessel's hospital, from where they advised the master of the accident. Other crew members soon arrived and administered first aid to the injured fitter, while the master notified the Company and then contacted the *Centro Internazionale Radio Medico* (CIRM) for medical advice. The CIRM advised the master to immediately arrange for the medical evacuation of the injured fitter.

The master contacted the French Maritime Rescue Coordination Centre (MRCC) and requested for the medical evacuation of the injured fitter. At 1124, following the MRCC's advice, the vessel was diverted towards Brest, France. At 1252, when *Dogan* was about 12 nm off Brest, a rescue helicopter approached the vessel. Paramedics boarded the vessel, provided medical treatment to the injured fitter, and prepared for his airlift. At 1330, the injured fitter was evacuated and transferred to a shore hospital in Brest.

### **Shore hospital medical examination**

At the shore hospital, the fitter was found to have suffered a fifth digit amputation, a palm wound and a wrist fracture on his right hand.

On 14 June, following medical treatment at the shore hospital in Brest, the injured fitter was deemed fit to be repatriated to his home country, where his medical treatment continued.

### **Personal protective equipment (PPE)**

While working on the lathe, the fitter was wearing a safety helmet, safety goggles, coveralls, and safety shoes.

### **Records of hours of work / rest**

The injured fitter was off duty for 15 hours, *i.e.*, from 1700 of 06 June until 0800 of 07 June, prior to commencing work on the day of the occurrence.

### **Drug / alcohol tests**

No drug / alcohol tests had been conducted on the injured fitter, following the occurrence.

**Past occurrences involving the ship's lathe**  
Numerous occupational accidents involving the lathe have occurred, both on board and ashore<sup>10</sup>.

The MSIU has published safety investigation reports on two occurrences where crew members suffered serious injuries while operating the ship's lathe.

MV *Titania*<sup>11</sup>: a crew member suffered several fractures (collarbone, ribs, and thoracic spine) while operating the vessel's lathe. The safety investigation concluded that the cast iron rod being worked on, had slipped from the tailstock while the lathe was rotating at a high speed (approximately 1600 rpm), deformed, and struck the crew member. The clamping lever of the lathe's tailstock sleeve had not been secured properly, which allowed the tailstock positioning handwheel to rotate under its own weight / vibration and thus, allowed the rod to slip out.

MV *Alula*<sup>12</sup>: a crew member suffered several facial injuries while operating the vessel's lathe. The injured crew member had no recollection of the accident and was only able to remember events that had taken place about four days before. In this occurrence, the lathe's chuck was also rotating at a high speed. The safety investigation concluded that the crew member's gloves and clothing got caught in the chuck of the vessel's lathe, while he was cleaning the surface of a machined shaft with an emery cloth.

Moreover, the safety investigation also came across an investigation report<sup>13</sup> on an accident similar to the one on *Dogan*. The accident had occurred in a commercial metal machining facility ashore. The investigation report included details of a how a machinist was smoothing out portions of a 36-inch long, two-inch diameter, high-nickel, stainless-steel alloy rod on a lathe. The machinist was holding a 15-inch metal file, perpendicular to the rod, when he misjudged his hand's proximity to the rotating chuck. The long sleeve of his sweater got caught in the rotating chuck and consequently, he was pulled into the lathe. He suffered traumatic blunt impact injuries to his left arm and head. He died instantly.

## ANALYSIS

### Aim

The purpose of a marine safety investigation is to determine the circumstances and safety factors of the accident as a basis for making recommendations, and to prevent further marine casualties or incidents from occurring in the future.

### Immediate cause of the accident

The fitter suffered serious injuries to his right hand while working on the vessel's lathe, when his right hand slipped and the sleeve of his coveralls got caught in the rough surface of the rotating steel rod, pulling his right hand towards the rotating chuck of the lathe.

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<sup>10</sup> The Occupational Safety and Health Administration (USA) has several such accident reports published on their website.  
[https://www.osha.gov/ords/imis/AccidentSearch.search?acc\\_keyword=%22Lathe%22&keyword\\_list=on](https://www.osha.gov/ords/imis/AccidentSearch.search?acc_keyword=%22Lathe%22&keyword_list=on)

<sup>11</sup> MSIU safety investigation report no. [05/2021](#).

<sup>12</sup> MSIU safety investigation report no. [14/2021](#).

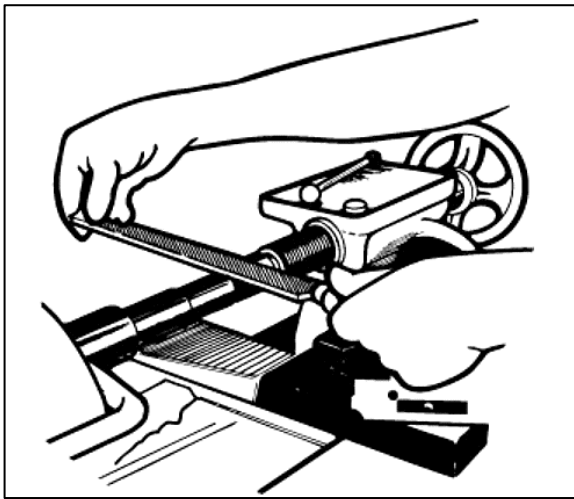
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<sup>13</sup> New Jersey Department of Health, Fatal Occupational Injuries Surveillance Project (FOIS). (2017). *Investigation Report FOIS 16-NJ-05*. Author.  
<https://www.nj.gov/health/workplacehealthandsafety/documents/fatal-injuries/16nj05.pdf>

### The fitter's grip on the file

The fitter was gripping the handle of the file with his right hand above the steel rod. The fitter could not advise why his hand had slipped down. However, this would be the expected direction of movement, considering the anti-clockwise rotation of the lathe's chuck (facing the chuck).

The Canadian Centre for Occupational Health and Safety (CCOHS) recommends gripping the file with the left hand, using the fingers of the right hand to balance and guide the file at the point (**Figure 8**)<sup>14</sup>.



**Figure 8: Recommended grip when using a file on a lathe**

Source: CCOHS

While the safety investigation was unable to determine the exact reason why the fitter preferred to grip the file in the manner that he did, it was noted that such a grip was also preferred elsewhere, by another experienced machinist<sup>15</sup>.

### Physical safety barriers and PPE

As mentioned earlier in this safety investigation report, the chuck guard was in place, while the carriage guard was moved aside to allow the fitter to use the hand file. In this regard, the safety investigation concluded that the physical safety barriers, *i.e.*, the chuck and barrier guard were appropriately used by the fitter.

The PPE worn by the fitter was also adequate in the sense that the fitter had donned head, eye, and body protection. Gloves were appropriately left out, as they would have posed an entanglement hazard<sup>16</sup>. When enquired about the sleeves of his coveralls, the fitter responded that firstly, he did not expect his hand to slip, explain that he had never experienced this before while filing on the lathe; and then, he also did not expect the material of his sleeve to get caught in the rough surface of the rod. The fitter elaborated that his sleeve cuffs were fitting well around his wrists and that there was no hazard of entanglement due to loose-fitting clothing.

### Stopping the lathe

The fitter informed the safety investigation that it took just seconds from the time his hand slipped down until it was pulled towards the rotating chuck. This caught him by surprise, and he did not have enough time to process what was happening and either step on the foot brake, or press the emergency stop button. His final position, hard against the lathe, prohibited him from activating any of the emergency stop functions. The presence of other crew members in the workshop, who immediately pressed the emergency stop and freed the fitter's hand, proved crucial in minimizing the extent of injuries suffered by the fitter.

<sup>14</sup> Canadian Centre for Occupational Health and Safety: Metalworking Machines – Lathes. Retrieved from: [https://www.ccohs.ca/oshanswers/safety\\_haz/metalworking/lathes.html](https://www.ccohs.ca/oshanswers/safety_haz/metalworking/lathes.html)

<sup>15</sup> *Vide* footnote 12.

<sup>16</sup> This had been detailed in the safety investigation report of MV *Alula*. *Vide* footnote 11.

### **Dealing with the hazards related to the operation of the lathe**

Accidents involving the operations of lathes are generally attributed to entanglement of clothing, gloves, jewellery, hair, *etc.*, inadequately clamped work pieces (as was the case on board MV *Titania*), working too close to the chuck jaws, guards not being fitted (as was the case on board MV *Alula*), guards not being used, or even the guards not offering adequate protection.

On board *Dogan*, the chuck guard did not extend further to cover the chuck jaws (seen in **Figure 4**). This, however, was a design issue and while some lathes are fitted with adjustable chuck guards, there are still several models of lathes (such as the one installed on *Dogan*) that are not fitted with adjustable chuck guards. Working with lathes that are not fitted with adjustable guards would require the user to take additional precautions to minimize the risk of an accident.

It may have been a coincidence that two other crew members were inside the workshop when the accident happened. As much as the fitter suffered from life changing injuries, the safety investigation was of the view that their presence and their immediate response and intervention prevented a more serious trauma which the fitter could have suffered.

### **Fatigue and consumption of drugs and / or alcohol**

As mentioned earlier in this safety investigation report, the fitter was off duty for 15 hours, prior to commencing work on the day of the accident. However, the safety investigation was unable to verify the quality of his rest.

Furthermore, although alcohol and drug tests were not carried out, the safety investigation did not have information which would have suggested that the fitter's behaviour was

influenced by drugs and / or alcohol and / or affected by fatigue.

To this effect, the safety investigation did not consider these factors as potential causes / contributors to the accident.

## **CONCLUSIONS**

1. The fitter's right hand slipped while filing a steel rod and the sleeve of his coveralls got caught in the rough surface of the steel rod being worked on, pulling his right hand towards the rotating chuck of the lathe.
2. The fitter was gripping the hand file with his right hand above the rod being worked on.
3. The crew members present in the vicinity, immediately stopped the lathe, thus minimizing the extent of injuries suffered by the fitter.

## **SAFETY ACTIONS TAKEN DURING THE COURSE OF THE SAFETY INVESTIGATION<sup>17</sup>**

Following the occurrence, the Company conducted a safety meeting with all crew members serving on *Dogan* and highlighted the necessary precautions when working on the lathe. Details of the accident were shared with all the vessels in the fleet, to be discussed during safety meetings.

The Company's manning agency was also informed so that the details are included in the pre-joining training sessions. The relevant vessel's risk assessment was amended accordingly.

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<sup>17</sup> **Safety actions shall not create a presumption of blame and / or liability.**



## **RECOMMENDATIONS**

Considering the safety actions taken by the Company, no recommendations have been made by the MSIU.

## SHIP PARTICULARS

Vessel Name:	<i>Dogan</i>
Flag:	Malta
Classification Society:	American Bureau of Shipping
IMO Number:	9625475
Type:	Bulk carrier
Registered Owner:	SPDBFL No. One Hundred and Ninety-Two (Shanghai) Ship Leasing Co. Ltd.
Managers:	Ciner Gemi Acente Isletmeleri Sanayi ve Tic. A.S., Türkiye
Construction:	Steel – Single hull
Length Overall:	180.00 m
Registered Length:	173.048 m
Gross Tonnage:	23,638
Minimum Safe Manning:	14
Authorised Cargo:	Dry cargo in bulk

## VOYAGE PARTICULARS

Port of Departure:	Alicante, Spain
Port of Arrival:	Antwerp, Belgium
Type of Voyage:	International
Cargo Information:	Soda ash – 32,054.8 mt
Manning:	19

## MARINE OCCURRENCE INFORMATION

Date and Time:	07 June 2023, at 09:00 LT
Classification of Occurrence:	Serious Marine Casualty
Location of Occurrence:	47° 21.1' N 006° 25.8' W
Place on Board	Engine department – workshop
Injuries / Fatalities:	One seriously injured crew member
Damage / Environmental Impact:	None
Ship Operation:	In passage
Voyage Segment:	Transit
External & Internal Environment:	Clear sky and good visibility. East Northeasterly strong breeze, with a rough sea and moderate swell. Air and sea temperatures: 17 °C and 15 °C, respectively.
Persons on board:	19