



REPUBLIC OF THE MARSHALL ISLANDS

Maritime Administrator

EAUBONNE CASUALTY INVESTIGATION REPORT

Ordinary Seafarer Fatality

South Atlantic Ocean | 25 June 2021

Official Number: 5933

IMO Number: 9663104



EAUBONNE was previously named GH STORM CAT

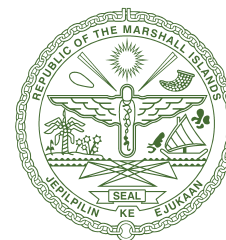
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In accordance with national and international requirements, the Republic of the Marshall Islands Maritime Administrator (the “Administrator”) conducts marine safety investigations of marine casualties and incidents to promote the safety of life and property at sea and to promote the prevention of pollution. Marine safety investigations conducted by the Administrator do not seek to apportion blame or determine liability. While every effort has been made to ensure the accuracy of the information contained in this Report, the Administrator and its representatives, agents, employees, or affiliates accept no liability for any findings or determinations contained herein, or for any error or omission, alleged to be contained herein.

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AUTHORITY

An investigation, under the authority of the Republic of the Marshall Islands laws and regulations, including all international instruments to which the Republic of the Marshall Islands is a Party, was conducted to determine the cause of the casualty.



Maritime Administrator

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LIST OF ABBREVIATIONS AND ACRONYMS

ASD.....	Able Seafarer Deck
C/O.....	Chief Officer
COVID-19.....	Coronavirus Disease 2019
kgs.....	Kilograms
m.....	Meter
m/min.....	Meters Per Minute
MLC, 2006.....	Maritime Labour Convention, 2006
mm.....	Millimeters
OS.....	Ordinary Seafarer
PPE.....	Personal Protective Equipment
SMS.....	Safety Management System
STCW Code.....	Seafarers' Training, Certification and Watchkeeping Code
SWL.....	Safe Working Load
UTC.....	Coordinated Universal Time



PART 1: EXECUTIVE SUMMARY

On 25 June 2021, the Republic of the Marshall Islands-registered bulk carrier EAUBONNE, managed by Union Commercial Incorporated (the “Company”), berthed starboard side at Abidjan, Republic of Côte d’Ivoire (hereinafter “Ivory Coast”). In addition to discharging a cargo of bagged rice, it was also planned to complete the landing of garbage during the call at Abidjan.

EAUBONNE was fitted with an electric monorail provision crane on the aft end of the accommodation, which had a SWL of 4 tons. The provision crane moves athwartship on a fixed monorail, attached to the underside of C deck. It is powered by an electric motor mounted in the center of the provision crane. When in use, the provision crane extends out over the ship’s side to allow the loading of stores, while remaining attached to the monorail at two locations.

During the morning, the C/O assigned the Bosun, an ASD, and an OS to discharge garbage using the provision crane. A Toolbox Talk was conducted with the assigned crewmembers. At about 0945,¹ the Bosun, ASD, and OS began to offload the garbage in a cargo net to the quay. The Bosun was operating the crane’s controls, while the ASD and OS assisted with management of the load. Three loads of garbage, each weighing about 200 kgs, were lowered without incident.

At about 1040 on 25 June 2021, the provision crane was extended out over the starboard side to lower a fourth load of garbage when the crane fell from the fixed monorail. The OS was pinned beneath the fallen provision crane and the ASD was struck by the crane when it fell. The Bosun was not injured in the incident and immediately notified the C/O. The general alarm was raised, and emergency medical assistance was requested from shore. Crewmembers mustered to help the injured OS and ASD. Upon arrival of the emergency medical personnel, they determined that the OS was deceased. The ASD was transported to a local hospital and eventually recovered from his serious injuries.

The marine safety investigation conducted by the Republic of the Marshall Islands Maritime Administrator (the “Administrator”) identified the following:

¹ Unless otherwise stated, all times are ship’s local time (UTC +0).

1. Causal factors that contributed to this very serious marine casualty include:
 - (a) the lack of stoppers on the port and starboard ends of the forward side of the fixed monorail as specified by the design plans;
 - (b) the failure of the aft stoppers on the travelling gear assembly;
 - (c) the close proximity of the stoppers to the end of the fixed monorail; and
 - (d) crewmembers working below the provision crane while it was being operated.
2. Causal factors that may have contributed to this very serious marine casualty include:
 - (a) excessive force being applied to the aft stoppers as a result of the missing stoppers on the forward side of the fixed monorail; and
 - (b) the design of the provision crane which resulted in the stoppers making contact at the same time the limit switches were activated, likely causing repetitive stress on the travelling gear assembly stoppers.

PART 2: FINDINGS OF FACT

The following Findings of Fact are based on the information obtained during the Administrator's marine safety investigation. Due to travel restrictions imposed in response to the COVID-19 pandemic, the Administrator was not able to arrange for onboard attendance as part of its marine safety investigation of this very serious marine casualty. All related information available to the Administrator was obtained remotely.

1. Ship particulars: *see* chart to right.
2. On 25 June 2021, EAUBONNE berthed starboard side to the quay at Abidjan, Ivory Coast and began discharging bagged rice. Garbage also needed to be discharged ashore using the ship's provision crane.

SHIP PARTICULARS

Vessel Name
EAUBONNE

Registered Owner
K/S Mountain Invest

ISM Ship Management
Union Commercial Incorporated

Flag State
Republic of the Marshall Islands

IMO No.	Official No.	Call Sign
9663104	5933	V7IF6

Year of Build	Gross Tonnage
2014	36,294

Net Tonnage	Deadweight Tonnage
21,607	63,307

Length x Breadth x Depth
194.8 x 32.2 x 18.5 m

Ship Type
Bulk Carrier

**Document of Compliance
Recognized Organization**
Bureau Veritas

**Safety Management Certificate
Recognized Organization**
Bureau Veritas

Classification Society
ClassNK

Persons on Board
22

- EAUBONNE was reported to have a 1° list to starboard and 1 m trim by the stern during discharging.

EAUBONNE’s Provision Crane Design

- EAUBONNE was fitted with a model ECM40 electric monorail provision crane, manufactured by Zhenjiang Just Marine Equipment Co. Ltd. The crane was situated athwartship, between the aft end of the Accommodation and the funnel. The crane was fixed to the underside of C deck and operated from A deck (see Figure 1).

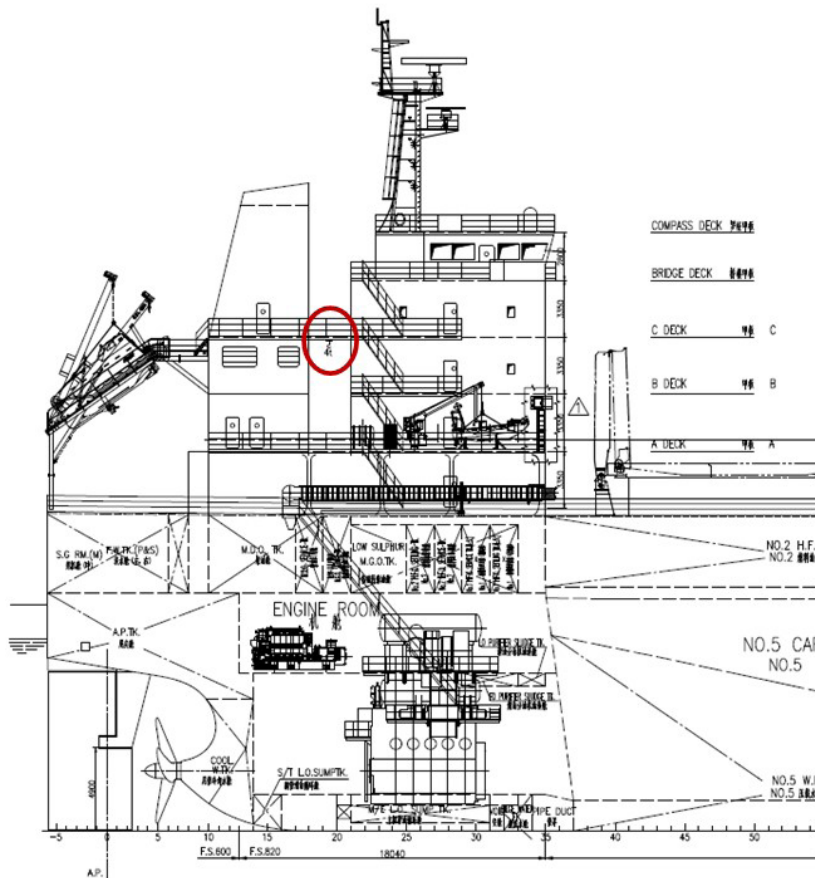


Figure 1: General arrangement plan showing the location of the provision crane.

- The entire provision crane assembly, including the fixed monorail, was provided to the shipyard by the crane manufacturer. It was installed aboard EAUBONNE during newbuilding (see Figure 2).

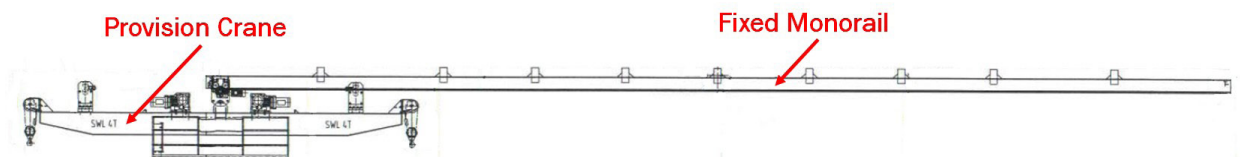


Figure 2: ECM40 provision crane installed aboard EAUBONNE.

6. Relevant technical specifications of the ECM40 provision crane installed aboard EAUBONNE:

SWL	4 tons
Safe Working Limits	5° trim, 2° list
Hoisting Speed	10 m/min
Lifting Height	30 m
Maximum Outreach Overboard	3 m
Traverse Travelling Speed	10 m/min
Provision Crane Length	10.66 m
Fixed Monorail Length	22 m
Provision Crane Weight	5,200 kg

7. The provision crane moved along the fixed monorail on two sets of support rollers and one travelling gear assembly (see Figures 2 and 3). The travelling gear assembly was powered by an electric motor, while the support rollers were not powered. The travelling gear was used to move the provision crane port and starboard along the fixed monorail by means of a pinion gear, which engaged a rack attached to the bottom side of the fixed monorail.

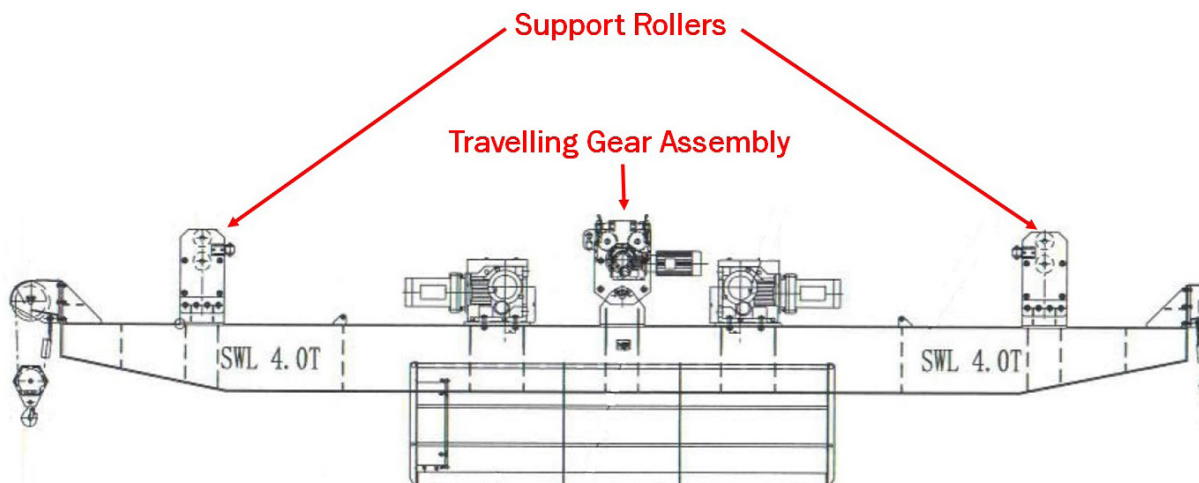


Figure 3: Diagram of the ECM40 provision crane installed aboard EAUBONNE, showing the travelling gear assembly and support rollers.

8. When in use, the provision crane extended outward, beyond the side of the ship, while being supported by the travelling gear assembly and one set of support rollers (see Figure 4).

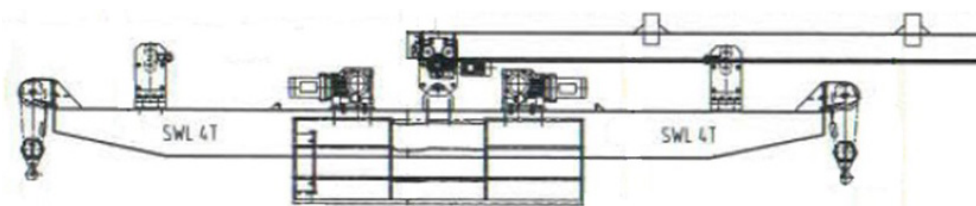


Figure 4: Diagram of the provision crane while extended beyond the side of the ship.

- Two mechanical spring arm limit switches were installed on the aft side of the travelling gear assembly. One switch was activated when the provision crane was fully extended to port, while the other activated when fully extended to starboard. The travelling gear assembly was also fitted with four stoppers, one at the port and starboard sides of each end (see Figure 5).

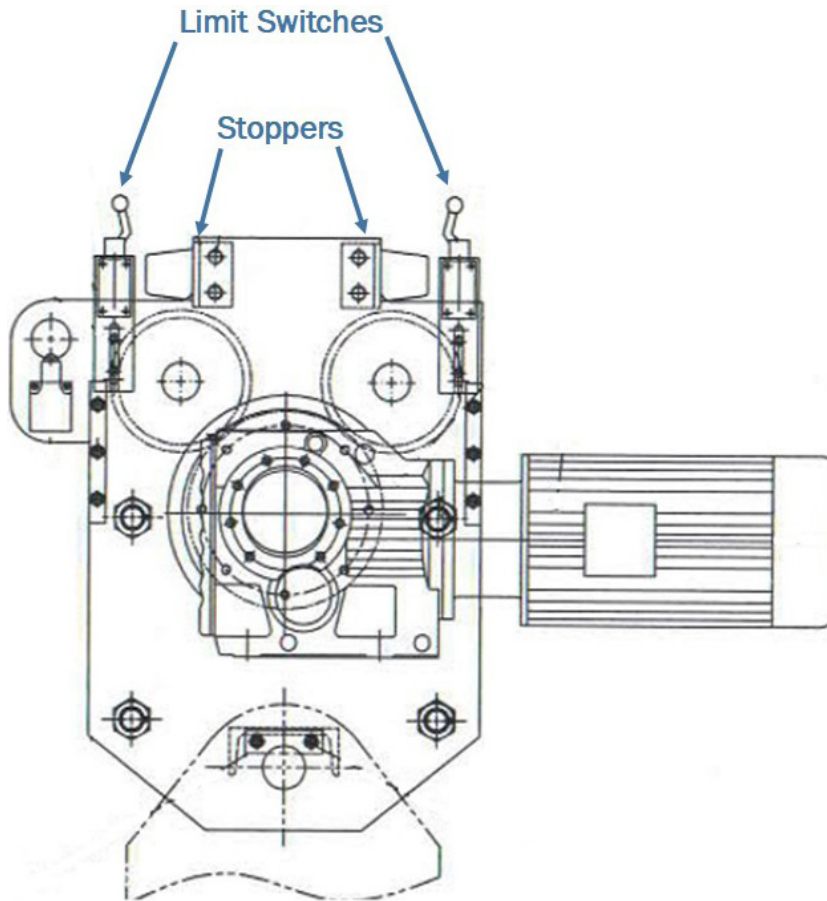


Figure 5: Profile diagram of the travelling gear, from the aft side.

- The stoppers were made of pieces of steel angle, bolted to the frame of the travelling gear assembly, and fitted with rubber bumpers (see Figure 6). The stoppers were not provided with support brackets or other strengthening.

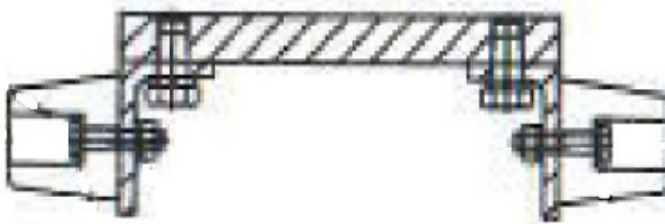


Figure 6: Diagram of the design of the stoppers installed on travelling gear, as viewed from above.

11. The technical drawings for the provision crane specify that the forward and aft sides of each end of the fixed monorail be fitted with stoppers to engage the stoppers on the travelling gear (see Figure 7). The stoppers are 160 mm from the ends of the fixed monorail. The drawings also specify that each end of the aft side of the fixed monorail be fitted with brackets to engage the limit switch when the crane was fully extended.

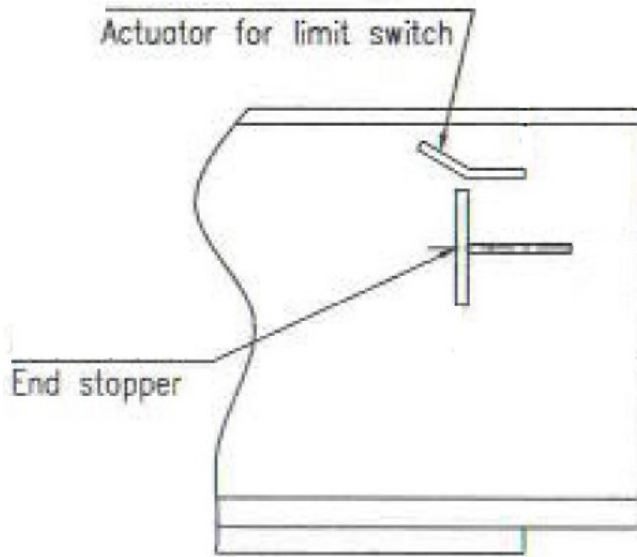


Figure 7: Diagram of the starboard end of the aft side of the fixed monorail showing the position of the bracket for engaging the limit switch and the stopper.

12. The end stoppers on the fixed monorail consisted of steel plates with steel reinforcement brackets on the outboard side, located 160 mm inboard from each end.
13. As designed, the limit switch on the travelling gear assembly would be activated at about the same time as the stoppers contacted.
14. The provision crane was operated by a handheld controller, which was attached to a 7 m cable. This cable was connected at the starboard side of the service platform that was installed on the provision crane (see Figure 8).

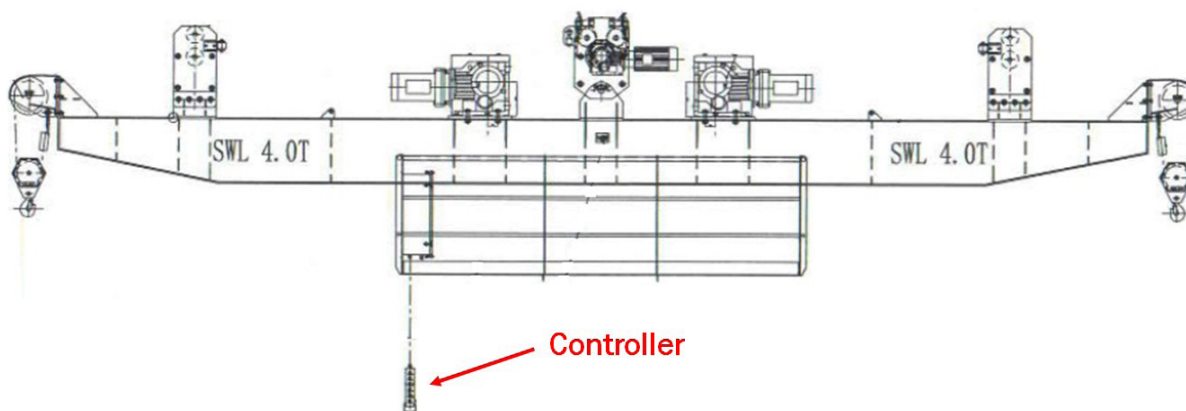


Figure 8: Location of the provision crane controller.

Incident

15. On the morning of 30 June 2021, the C/O assigned the Bosun, an ASD, and an OS to discharge garbage to shore using the provision crane. The C/O conducted a Toolbox Talk to discuss the planned operation with the assigned crewmembers.
16. At about 0945, the Bosun, ASD, and OS began discharging garbage to shore using the provision crane. The Bosun was operating the provision crane's controls, while the ASD and OS were assisting.
17. Bags of garbage were placed into a cargo net, which was then attached to the starboard hook of the provision crane (*see Figure 9*).



Figure 9: Photo of the garbage in the cargo net at the time of the provision crane's failure.

18. The Bosun used the provision crane's controller to hoist the cargo net and then extended it out over the starboard side so that it could be lowered to the quay. The empty cargo net was subsequently hoisted up and the provision crane shifted inboard. This process was successfully completed three times. It is reported that each of these loads weighed about 200 kgs.
19. The starboard accommodation ladder was located below the provision crane and lowered to the quay at the time. This required the provision crane to be fully extended overboard to clear the accommodation ladder.
20. At about 1040, a fourth load of garbage was being lowered to the quay. The provision crane was being extended out over the starboard side when it fell from the fixed monorail to the deck below (*see Figure 10*).



Figure 10: Photos of the provision crane following the incident.

21. At the time, the Bosun was using the controller to operate the provision crane while the ASD and OS were monitoring the load. The OS was pinned beneath the provision crane and the ASD was struck when it fell.² The Bosun was not injured.
22. The load of garbage that was being lowered at the time of the incident was estimated to weigh about 200 kgs.
23. The Bosun immediately notified the C/O that the provision crane had failed and that crewmembers were injured.
24. The Master heard a loud sound and immediately directed the Duty Officer to investigate the cause. At about the same time, the Duty Officer was notified of the incident by the C/O. The Duty Officer then informed the Master that the provision crane had fallen to the deck, injuring two crewmembers.
25. The Master sounded the general alarm and used the ship's public address system to inform the other crewmembers. The Master also requested emergency medical assistance from local authorities.
26. Responding crewmembers found that the OS was pinned beneath the provision crane and was not breathing. They noted that he appeared to have suffered severe injuries and may be deceased.
27. The ASD had several injuries to his head and face but remained conscious. Crewmembers began providing him first aid while awaiting arrival of emergency medical personnel.
28. At 1046, emergency medical personnel arrived on board EAUBONNE. They determined that the OS was deceased. They also provided care to the ASD and transported him to a local hospital. The ASD was subsequently discharged from the hospital three days later and repatriated.

² It is not known exactly where the ASD and OS were standing at the time of the incident; however, it is known that they were both beneath the provision crane.

29. A death certificate for the OS was issued by local authorities in Abidjan. However, postmortem examination was not conducted due to the ongoing COVID-19 pandemic. The death certificate does not identify the cause of death.

Post Incident Examination of Provision Crane

30. When inspected following the incident, all of the provision crane’s rollers were found intact, with no indication of failure (see Figure 11).



Figure 11: Photo of the travelling gear assembly. Note the missing aft stoppers circled in red.

31. The bolts attaching the housing for the inboard set of support rollers were found sheared. The housing and rollers remained attached to the fixed monorail (see Figure 12).

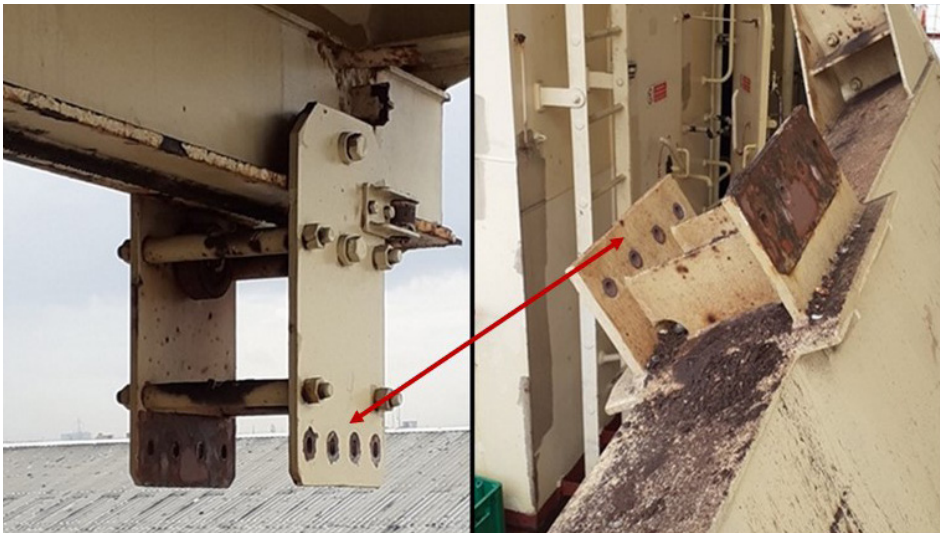


Figure 12: Photos of the inboard support roller assembly.

32. It was observed that both stoppers on the aft side of the travelling gear were sheared off, with the mounting bolts intact. One of the broken stoppers was found on deck immediately after the incident. The broken stoppers showed signs of rust and scale. The stoppers on the forward side were intact, with no signs of wear (see Figure 13).

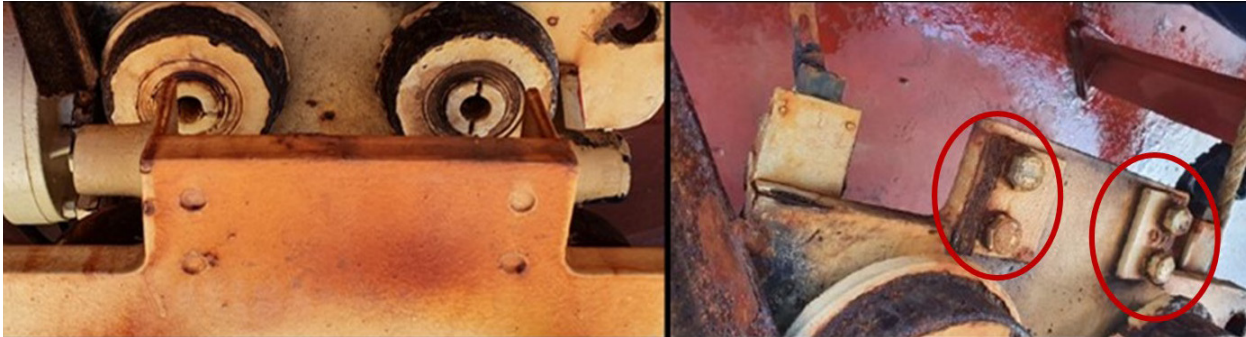


Figure 13: Photos of the travelling gear assembly stoppers, showing the intact forward stoppers (left) and the broken aft stoppers (right and circled in red).

33. Both limit switches installed on the travelling gear assembly were intact and found operational following the incident (see Figure 14).



Figure 14: Photo of the limit switch on the aft, starboard side of the travelling gear assembly. The broken aft, starboard side stopper is circled in red.

34. Stoppers and brackets for engaging the limit switches on the traveling gear assembly were fitted on both ends of the fixed monorail's aft side. These were found to be intact following the incident (see Figure 15).



Figure 15: Photos of the aft side of the fixed monorail, showing the stoppers and the brackets to engage the limit switches.

35. Stoppers were not installed on either end of the fixed monorail's forward side, nor was there any indication that they had been installed previously (see Figure 16).



Figure 16: Photos of the forward side of the fixed monorail showing the lack of stoppers.

36. Following the incident, the controller was found to be intact and functioning properly (see Figure 17).



Figure 17: Controller for the provision crane.

Provision Crane Maintenance

37. The Company's SMS includes requirements for routine inspection and maintenance of lifting appliances. The SMS states that this includes, but is not limited to, the following:

- (a) thorough and frequent greasing;
- (b) regular inspection of all rope, wire, and chain for signs of wear, damage, and corrosion;
- (c) regular inspection of all shackles, links, and rings for signs of damage or wear;
- (d) frequent examination of structures, bearings, and securing points for corrosion, cracks, distortion, and wear; and
- (e) regular functional testing of controls, stops, brakes, and safety devices.

38. The SMS also recommends that functional tests of controls, stops, brakes, and safety devices be conducted before each use of the lifting appliance.

39. In addition to the inspections performed by the crewmembers, the SMS requires that each lifting appliance be thoroughly inspected at least annually by a competent person. The SMS also requires that lifting appliances be load tested at least every five years.

40. The provision crane was not subject to inspection by ClassNK.³

41. The provision crane was last load tested by a third-party service provider on 16 November 2019. The load testing certificate indicates that the crane was subjected to a 5-ton test load and that the results were satisfactory. No defects or issues were reported by the agency that conducted the testing.

42. The manufacturer of the provision crane provided a schedule for periodic maintenance. This included lubrication of numerous points on the crane at various intervals. Records available indicate that the manufacturer's recommended maintenance had been completed.

³ Only the deck cranes aboard EAUBONNE were subject to thorough examination by ClassNK.

43. Prior to the day of the incident, the provision crane had last been used to bring provisions aboard on 26 June 2021. The ship was berthed at Abidjan at the time. No incidents or defects were reported.

Safe Working Procedures

44. The Company’s SMS also included safe working procedures specific to the use of cranes. These procedures require that:

- (a) operating mechanisms and safety devices be tested prior to use;
- (b) non-essential crewmembers remain clear of the immediate area;
- (c) the actual weight of the load be known;
- (d) the rated capacity of the crane never be exceeded;
- (e) safety devices, such as limit switches, be fully functional; and
- (f) crewmembers working on or around cranes wear safety shoes, safety helmets, and gloves.

45. It is reported that the limit switches and controls for the provision crane were tested prior to use, with no defects noted.

46. At the time of the incident, the ASD and OS were wearing the PPE required by the Company’s safe working procedures.

47. There is no indication that the SWL of the crane had been exceeded at the time of the incident. It cannot be determined if the SWL had been exceeded prior to the Company assuming management of the ship.⁴

EAUBONNE’s Crew

48. EAUBONNE had a complement of 22 crewmembers, six more than required by the Minimum Safe Manning Certificate issued by the Administrator.

49. Crew Experience:

RANK	TIME ON BOARD EAUBONNE	TIME IN RANK	TIME WITH COMPANY	TOTAL TIME AT SEA
Master	4 months	7 years, 4 months	4 months	13 years, 7 months
C/O	4 months	3 years, 7 months	1 year, 10 months	9 years, 10 months
Bosun	4 months	7 years, 7 months	7 years, 7 months	10 years, 6 months
ASD	4 months	4 years, 11 months	6 years	6 years
OS	4 months	2 years, 10 months	2 years, 4 months	2 years, 10 months

50. All involved crewmembers held the appropriate Republic of the Marshall Islands-issued seafarer documentation for their positions.

51. The Administrator did not find any indication that crewmembers involved with this incident failed to receive the amount of rest mandated by the STCW Code, Section A-VIII/1, paragraphs 2 and 3 and the MLC, 2006, Regulation 2.3.

⁴ The Company assumed management of EAUBONNE on 25 February 2021.

52. The Company's SMS requires that crewmembers complete familiarization training prior to working aloft or operating any deck crane. This training includes familiarization with the operating manuals, SWLs, limit switches, emergency stops, and the potential hazards associated with crane use. Additionally, the C/O or Bosun must witness the crewmember's competent use of the cranes. Records available on board indicate that the Bosun, ASD, and OS completed this familiarization training for the provision crane on 26 February 2021.

PART 3: ANALYSIS

The following Analysis is based on the above Findings of Fact.

On the morning of 30 June 2022, the provision crane was being operated by the Bosun to discharge garbage to the quay, with assistance from an ASD and OS. Three loads of garbage had been discharged without incident. While extending the provision crane out over the starboard side of the ship to discharge the fourth load of garbage, the crane fell from the overhead fixed monorail and onto the deck.

When the provision crane fell from the fixed monorail, the ASD was struck while the OS was pinned beneath. The OS was pronounced deceased as a result of the injuries sustained, while the ASD was seriously injured. The Bosun was not injured in the incident. It is not known exactly where each crewmember was standing at the time of the incident. However, the ASD and OS were both standing beneath the provision crane as they were assisting with collection of the garbage and monitoring to the load.

Normal Operation of the Provision Crane

During normal operation, a crewmember uses the controller to operate the provision crane. The crane moves horizontally along the fixed monorail. To lower a load to the quay, the load would be hoisted while the crane was inboard from the side of the ship. Once hoisted, the motor in the travelling gear assembly would be activated causing the provision crane to move to port or starboard and extend out over the side of the ship. The load could then be lowered to the quay. The crane would need to be shifted inboard for each subsequent load.

The motor in the travelling gear assembly powers a pinion gear along a rack that is attached to the underside of the fixed monorail causing the crane to move to port or starboard when the controller is activated. As the provision crane reaches the fully extended position, a mechanical limit switch on the travelling gear assembly contacts a bracket on the fixed monorail. This turns off the travelling gear motor. Stoppers on the travelling gear assembly and fixed monorail stop the crane from extending further overboard than designed. The stoppers contact each other at about the same time that the limit switch is activated when the crane is fully extended. This results in the crane being driven into the stoppers whenever the operator does not disengage the motor prior to the limit switch being activated.

Post-incident Examination of the Provision Crane

When the provision crane was examined following the incident, both stoppers on the aft side of the travelling gear assembly were found to be broken at their base while the stoppers on the forward side were intact. One of the broken aft stoppers was found on the deck below the provision crane. Both of the limit switches on the travelling gear assembly

were intact and operational when tested following the incident. The pinion gear and rollers of the travelling gear assembly were found to be intact, with no defects or damage noted.

The fixed monorail remained attached to the underside of C deck. There were no signs of damage, excessive wear, or deformation of the fixed monorail following the incident. The stoppers and brackets which activated the limit switches were both intact on the aft side of the fixed monorail. However, it was observed that the forward side of the fixed monorail did not have stoppers installed at either end. Design plans for the fixed monorail indicate that stoppers were required to be fitted on both ends of the forward side. There is no indication that the forward stoppers had been fitted during the initial construction of the crane or after being put into service.

Additionally, the provision crane controller was examined following the incident and found to be functioning properly. It is also reported that the controller was working properly during the three previous lifts conducted that morning. There is no indication that a defect of the controller contributed to the failure of the provision crane.

Failure of the Provision Crane

Based on the information available, it is most likely that the provision crane overextended and caused the travelling gear assembly to fall from the end of the fixed monorail.

As the Bosun used the controller to extend the provision crane out over the starboard side of the ship, the starboard limit switch on the travelling gear assembly should have contacted the bracket on the fixed monorail, stopping the travelling gear assembly motor if the Bosun had not already released the control button. The stoppers on the travelling gear assembly and fixed monorail should have also contacted each other at the same time to arrest the crane's horizontal motion. The lack of stoppers on the forward side of the fixed monorail resulted in the full force of the crane being applied only to the aft stoppers. This increased force likely caused the stopper on the travelling gear assembly to fail, allowing the provision crane to extend further overboard than designed. Since the stoppers on the aft side of the fixed monorail were only 160 mm from the end, it is likely that the provision crane fell off the end of the fixed monorail. This caused the outboard side of the crane to fall to the deck and subsequently resulted in the failure of the support rollers on the inboard end.

It is not known exactly what caused the provision crane to continue to move outboard after the stopper failed. It is possible that the momentum of the crane moving outboard carried it past the end. It is also possible that the limit switch travelled past the bracket which activated it, causing the motor to re-energize if the button on the controller had not yet been released.

When the provision crane fell, the inboard set of support rollers (port side of the provision crane) remained attached to the fixed monorail. The bolts holding the bracket for this set of support rollers had been sheared from the bracket on the provision crane. It is likely that the support roller assembly separated from the provision crane as it was falling to the deck. There is no indication that this occurred prior to the outboard side of the crane falling and, therefore, is not considered a causal factor of the incident.

Provision Crane Design and Construction

The bracket on the fixed monorail which activates the limit switch on the travelling gear assembly was fitted in a position which resulted in the limit switch activating at the same time that the stoppers made contact. This would have subjected the stoppers on the aft side of the provision crane to repetitive stress each time the provision crane was fully extended until limit switch activation.

The design plans for the provision crane specify that stoppers were to be fitted on the forward and aft sides of the travelling gear assembly and fixed monorail. However, when examined after the incident it was noted that stoppers were not fitted on the forward side of either end of the fixed monorail. Additionally, there was no indication that the stoppers had been fitted in the past. The lack of stoppers on the forward side resulted in the entire force of stopping the provision crane being carried by the aft stoppers when the crane was fully extended overboard.

The full provision crane assembly, including the fixed monorail, was supplied by the manufacturer to the shipyard while EAUBONNE was being built. The Company had assumed management of the ship on 25 February 2021 and, therefore, was not involved in the newbuilding process. Based on the information available to the Administrator, the provision crane was not constructed in accordance with the design plans. Additionally, there is no indication that the lack of stoppers on the forward side of the travelling beam were identified during any inspections during or after construction of the ship.

Loading of Provision Crane

At the time of failure, the provision crane was suspending about 200 kgs of garbage secured in a cargo net. This was only 5% of the SWL, which was 4 tons. The three previous lifts that morning were reported to also have been about 200 kgs each. Additionally, the crane had last been load tested on 16 November 2019, using a 5-ton test load. Records indicate that no defects or issues were noted during the load testing. Therefore, overloading of the provision crane on the day of the incident is not considered a causal factor.

PART 4: CONCLUSIONS

The following Conclusions are based on the above Findings of Fact and Analysis and shall in no way create a presumption of blame or apportion liability.

1. Causal factors that contributed to this very serious marine casualty include:
 - (a) the lack of stoppers on the port and starboard ends of the forward side of the fixed monorail as specified by the design plans;
 - (b) the failure of the aft stoppers on the travelling gear assembly;
 - (c) the close proximity of the stoppers to the end of the fixed monorail; and
 - (d) crewmembers working below the provision crane while it was being operated.

2. Causal factors that may have contributed to this very serious marine casualty include:
 - (a) excessive force being applied to the aft stoppers as a result of the missing stoppers on the forward side of the fixed monorail; and
 - (b) the design of the provision crane which resulted in the stoppers making contact at the same time the limit switches were activated, likely causing repetitive stress on the travelling gear assembly stoppers.

PART 5: PREVENTIVE ACTIONS

In response to this very serious marine casualty, the Company has taken the following Preventive Actions.

1. A fleet circular was immediately sent to all ships in the Company's managed fleet to alert crewmembers of the crane failure and to ensure visual inspection of any similar cranes.
2. Another fleet circular was sent to all ships in the Company's managed fleet to share the lessons learned following the Company's investigation.
3. The provision crane was modified by:
 - (a) moving the brackets that engage the limit switches so that the motor will be disengaged prior to the stoppers contacting;
 - (b) installing an additional limit switch on each side of the travelling gear assembly as redundancy in the event of the failure of the primary limit switches; and
 - (c) installing stronger stoppers on both ends of the fixed monorail.
4. The provision crane will be added to the ship's cargo gear booklet, resulting in annual inspections by the Classification Society and five-year load testing.
5. A warning has been stenciled on the fixed monorail to warn against operating the crane at or near full extension.
6. A warning has been stenciled on the deck, below the provision crane, to remind crewmembers to stand clear of the crane and any suspended load during operation.
7. Additionally, the Administrator issued Marine Safety Advisory No. 10-21 detailing the circumstances of the incident and recommending that similar cranes on all Republic of the Marshall Islands-registered ships be visually inspected by the crewmembers.

PART 6: RECOMMENDATIONS

Based on the above Conclusions and in consideration of the Preventive Actions taken, the Administrator has no Recommendations.

The Administrator's marine safety investigation is closed. It will be reopened if additional information is received that would warrant further review.