



REPUBLIC OF THE MARSHALL ISLANDS

Maritime Administrator

OU YA LENG 6 CASUALTY INVESTIGATION REPORT

Grounding and Total Constructive Loss

Taka Atoll, Republic of the Marshall Islands | 2 January 2019

Official Number: 412436952

IMO Number: Not Assigned



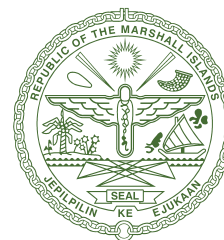
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AUTHORITY

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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PART 1: EXECUTIVE SUMMARY

During the night of 2 January 2019, the People’s Republic of China (PRC)-registered fishing vessel OU YA LENG 6 went aground on Taka Atoll in the Republic of the Marshall Islands. The grounding resulted in declaring the vessel a total constructive loss. The grounding caused extensive damage to the subtidal and intertidal reef and about 155-160 tons of fuel oil leaked from the vessel’s tanks onto the reef and into the surrounding waters.

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

1. Causal factors that contributed to this very serious marine casualty include:
 - (a) the vessel was provided with inadequate navigation equipment for safe navigation on an ocean voyage by Ningbo Eurasian Ocean Fishery Co., LTD (the “Owner”);
 - (b) the vessel was provided with small scale, poor quality electronic charts that were not intended for use on board commercial vessels;
 - (c) ineffective voyage planning by the vessel’s Master;
 - (d) ineffective navigation watchstanding by the duty Officer on Watch (OOW);
 - (e) ineffective use of the vessel’s navigation equipment by the Master and duty OOW; and
 - (f) the duty OOW may have received insufficient training and supervision by the vessel’s Master to stand a navigational watch.

PART 2: FINDINGS OF FACT

The following Findings of Fact are based on the information obtained during the Administrator’s marine safety investigation.

1. Vessel particulars: *see* chart on page 7.
2. OU YA LENG 6 is fitted with three refrigerated cargo holds and has a loaded draft of 5.9 meters (m) (*see Figure 1*).

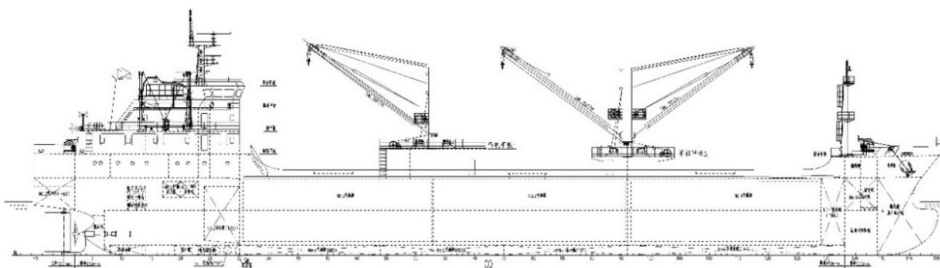


Figure 1: OU YA LENG 6 General Arrangement Drawing.¹

¹ Zhejiang Seahead Ship Design and Research Institute Co, Ltd., Drawing LJX8635-100-04, dated December 2015.

3. The PRC-registered OU YA LENG 6 was a refrigerated fish carrier regulated as a fishing vessel by the Ministry of Agriculture.²
4. OU YA LENG 6 was owned and operated by the Owner.
5. The vessel had an International Fishing Vessel Safety Certificate issued by the China Classification Society (CCS) that conformed with the IMO's Cape Town Agreement of 2012 on the Implementation of the Provisions of the Torremolinos Protocol of 1993 relating to the Torremolinos International Convention for the Safety of Fishing Vessels, 1977 (Torremolinos Convention) on 14 November 2018.³ This certificate was issued in accordance with the PRC Code for Statutory Surveys of Fishing Vessels.
6. The vessel's flag State had not established compulsory requirements to have a Safety Management System or similar procedures for fishing vessels such as OU YA LENG 6.

Navigation Equipment

7. The Torremolinos Convention Chapter V, regulation 4 requires fishing vessels over 45 m be fitted with "suitable nautical instruments, adequate and up-to-date charts, sailing directions, lists of lights, notices to mariners, tide tables and all other nautical publications necessary for the intended voyage, to the satisfaction of the Administration."
8. The vessel's Master stated the navigation equipment on board included a global positioning system (GPS) receiver, an S-band and an X-band radar, an electronic chart display and information system (ECDIS) and an automatic identification system (AIS).
9. The Master stated the ECDIS was used for navigation. He also reported that the only paper charts on board were small scale charts of the Pacific Ocean.
10. The Owner informed the Administrator that the electronic chart display system on board OU YA LENG 6 was an Xinuo HM-5817. The HM-5817 was type approved by the CCS as an electronic chart system (ECS).

² There are similar vessels carrying frozen fish as cargo that are regulated by other flag States as cargo ships and are subject to the requirements of the International Maritime Organization's (IMO's) International Convention for the Safety of Life at Sea, 1974 (SOLAS).

³ The PRC was not a signatory of the Torremolinos Convention but signed the Torremolinos Declaration on the Torremolinos Convention on 21 October 2019. The Torremolinos Declaration is intended to promote the entry-into-force of the Torremolinos Convention.

VESSEL PARTICULARS

Vessel Name

OU YA LENG 6

Registered Owner

Ningbo Eurasian Ocean Fishery Co., LTD

ISM Ship Management

Not Applicable

Flag State

People's Republic of China

IMO No. Not Assigned	Official No. 412436952	Call Sign BZW7A
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Year of Build 2015	Gross Tonnage 3,289
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Net Tonnage 1,524	Deadweight Tonnage Not Available
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Length x Breadth x Depth
94 x 15.4 x 8.4 meters

Vessel Type

Fishing Vessel – Refrigerated Ship

Document of Compliance

Recognized Organization

Not Applicable

Safety Management Certificate

Recognized Organization

Not Applicable

Classification Society

China Classification Society

Persons on Board

24

11. The Master and Third Officer (3/O) both used the term “ECDIS” rather than ECS when they were interviewed. Although an ECS can perform many of the same functions of an ECDIS, an ECS is not required to comply with the ECDIS performance standards established by IMO resolution MSC.232(82). The CCS type-approval was based on operational, performance, and testing requirements established by the PRC Marine Safety Administration (MSA) for an ECS.⁴
12. Based on the Certificate of Type Approval issued by CCS, the HM-5817 can display electronic navigational charts (ENC) that comply with the International Hydrographic Organization’s (IHO’s) S-57 standard and is intended for use on commercial vessels operating on coastal and inland waters.⁵ The vessel’s ECS can also sound an alarm when the vessel is within a user-defined distance from a waypoint or is to the left or right of the planned route.⁶ The Master indicated neither of these alarms had been set-up.
13. The Owner reported the electronic chart on board the vessel that included the Marshall Islands was C-MAP PC-M203. The geographic area covered by this chart also includes the Caroline Islands, Line Islands, Phoenix Islands, Gilbert Islands, and Mariana Islands. The C-MAP PC-M203 is intended for use on leisure or recreational vessels, but not commercial vessels.⁷ It is small scale, based on source data from multiple hydrographic offices, classified by C-MAP as low quality, and is updated only twice a year.⁸ Caution messages and notices to mariners are not included on the C-MAP PC-M203.
14. The best scale ENC that includes Taka Atoll is the United Kingdom Hydrographic Office (UKHO) GB200761. This ENC is intended for ocean navigation, approaching coasts, and route planning.⁹ GB200761 included notes stating the ENC is based on small scale planning charts and that caution is advised when navigating near dangers due to the age and quality of the source information. The ENC also includes a note advising mariners to confirm GPS positions displayed on the ECDIS using other navigational techniques “particularly when closing the shore or navigating in the vicinity of dangers.”
15. The Owner reported that OU YA LENG 6 had been provided with a copy of Chart No. 612 issued by the Navigation Guarantee Department of the Chinese Navy, which is the PRC’s official hydrographic office.¹⁰ This chart, which extends from Wake Island to the north west to New Ireland, Papua New Guinea, has a scale of 1:3,500,00 and is intended for ocean navigation.¹¹ The largest scale paper chart that includes Taka Atoll is UKHO Chart No. 761. The scale of this chart was 1:500,000.

⁴ ECS will be used from here forward when referring to the HM-5817 on board OU YA LENG 6.

⁵ The Administrator could not determine if fishing vessels regulated by the PRC’s Ministry of Agriculture operating on the high seas are permitted to be fitted with ECS as their primary means of navigation. It is noted that PRC-registered ships regulated by the MSA are required to be fitted with an ECDIS when engaged in international service.

⁶ See Xinuo HM-5817 Electronic Chart System User’s Manual.

⁷ The electronic charts produced by C-MAP that are intended for use on commercial vessels are sold as C-MAP Professional+. These are type approved system electronic navigational charts (SENC) as meeting the requirements of the IMO ECDIS performance standard and are based on official ENCs produced by a hydrographic office in accordance with applicable IHO standards. See <https://commercialmarine.c-map.com/en/charts-and-publications/charts/c-map--professional>.

⁸ See <https://store.c-map.com>.

⁹ Paper nautical charts covering a similar geographic area as GB200761 would have a scale between 1:350,000-1:499,999. See IHO, Transfer Standard for Digital Hydrographic Data, Special Publication No. 57, Appendix B1, paragraph 2.1 and S-66 – Facts about Electronic Charts and Carriage Requirements, Ed. 1.1.0, January 2018.

¹⁰ The vessel had also been provided with a copy of Chart No. 613 and No. 617, which included water of the South Pacific to the east and southeast of the Republic of the Marshall Islands.

¹¹ The scale of charts intended for coastal navigation are between 1:50,000 and 1:150,000.

Navigation Procedures

16. The Owner did not have established procedures addressing voyage planning or navigation watchstanding for vessels in its fleet.

Voyage Information

17. On 21 December 2018, OU YA LENG 6 departed Zhoushan, PRC in ballast on a voyage to load catch from fishing vessels operating on the southeastern Pacific Ocean fishing grounds.
18. The Master stated that he planned and plotted the vessel's route on the ECS prior to departing Zhoushan. The end of the planned route was waypoint No. 6 (see Figure 2). This waypoint was 9 nautical miles (NM) west-northwest of Taka Atoll. He also stated that when he planned the voyage, the location where the fishing vessels from which OU YA LENG 6 was to load catch was not known. He stated he intended to decide the vessel's course when the fishing vessels' positions were known.

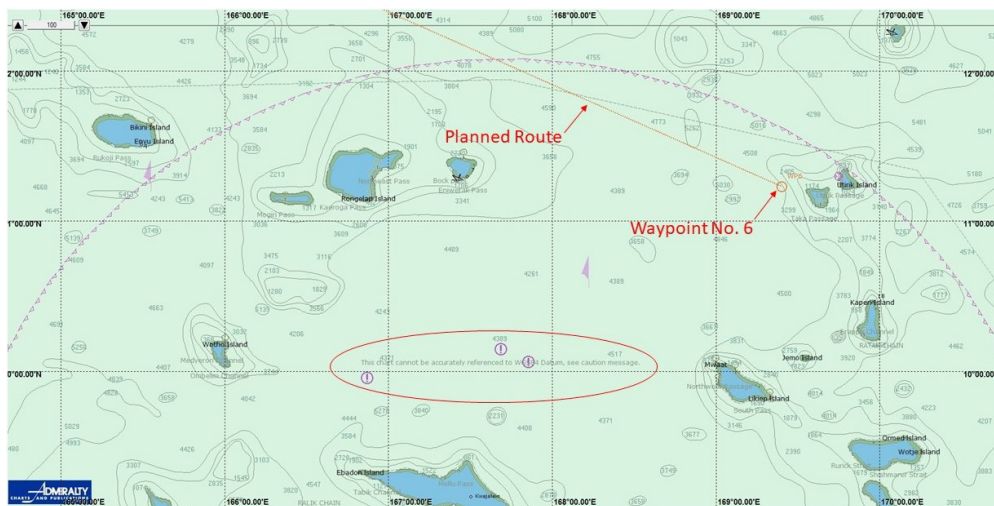


Figure 2: OU YA LENG 6's planned route (orange line) in the vicinity of the Marshall Islands. The vessel's route was plotted by the Administrator on UKHO GB200761. The referenced caution message (circled in red) warns mariners to confirm GPS positions displayed on the ECDIS using other navigational techniques "particularly when closing the shore or navigating in the vicinity of dangers."

19. On the evening of 2 January 2019, OU YA LENG 6 was underway, steering 115° True (T) at a speed of slightly more than 10 knots. Based on AIS information, the vessel's course over ground was 119° T. The Master reported that all navigation equipment, the main engine, auxiliary engines, and steering gear were operating properly.
20. The weather was reported as winds from the northeast at approximately 30 knots, with seas of approximately 3 m. The visibility was approximately 1 NM, with heavy rain.
21. The 3/O was the duty OOW from 2000-2400.¹² He stated the steering was by autopilot. One of the ratings was on duty as the lookout.¹³

¹² Unless otherwise stated, all times are the vessel's local time (UTC +11).

¹³ The crew list included 17 ratings. No distinction was made between levels or whether they were assigned to work on deck or in the machinery spaces.

22. Based on AIS information, OU YA LENG 6 was approximately 3-4 NM to the north of the planned route for most of the day on 2 January 2019. No course changes were made from 2000 onwards.
23. The Master stated he issued Night Orders instructing the duty OOW to call him at 2200. He also stated that at 2000 he had reminded the 3/O to call him at 2200. This was when the Master expected the vessel would reach waypoint No. 6. The Master did not leave instructions for the duty OOW regarding whether to change course or reduce speed when the vessel was at this waypoint.
24. Neither the duty OOW reported calling, nor did the Master report receiving a call from the duty OOW at 2200. The duty OOW stated he had focused on the weather conditions and forgot to call the Master. Based on AIS information, OU YA LENG 6 was approximately 10 NM from Taka Atoll at 2200 (see Figure 3).

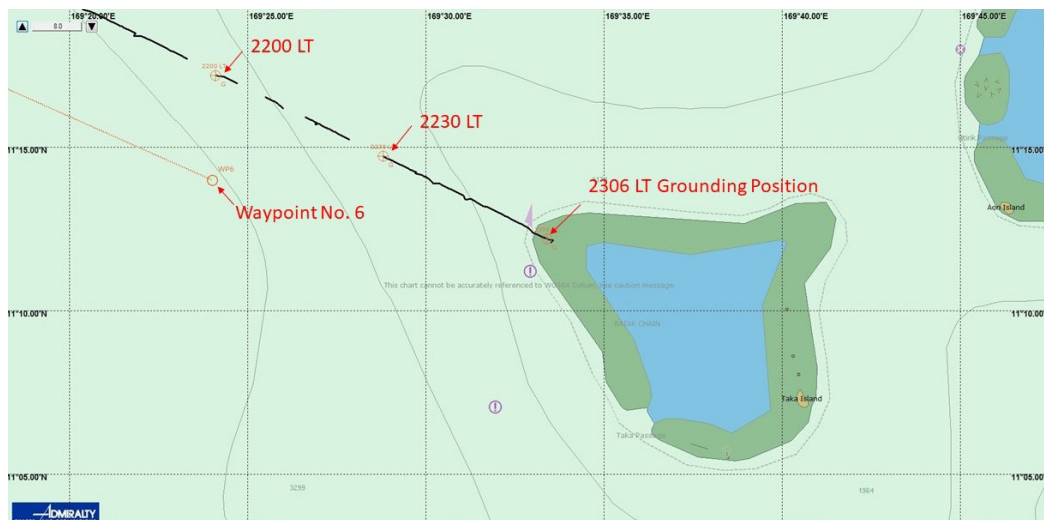


Figure 3: OU YA LENG 6's track (broken black line) based on AIS information showing the vessel's positions at 2200 and 2230 and where it went aground on Taka Atoll. The planned route is the orange dotted line.

25. The duty OOW stated he saw something ahead of the vessel at 2230. He thought it might have been land, but he was not sure. He did not check the vessel's position on the ECS or either of the radars to determine if what he saw might be land. Based on AIS information, the vessel was approximately 5 NM from Taka Atoll. The lookout did not report seeing anything before the grounding.
26. Taka Atoll consists of six small islets and a coral barrier reef. The principle land is Taka Island on the southeast side of the atoll. The islets are low, uninhabited, and some are covered with coconut palms.¹⁴
27. The Master stated OU YA LENG 6 went aground on Taka Atoll at 2315. Based on AIS information, the vessel was aground by 2306. Before going aground, the vessel's course was 117° T and speed was about 10 knots.

¹⁴ See United States (US) National Geospatial-Intelligence Agency, Pub. 126 Sailing Directions (Enroute) Pacific Islands (12th edition, 2017), sector 4, paragraph 4.58.

28. Immediately after the vessel went aground, the Master ordered activation of the vessel's Emergency Position Indicating Radio Beacon, and made distress calls on both the very high frequency (VHF) and high frequency (HF) radios.
29. The Master and duty OOW both reported that waves were breaking over the vessel's stern and starboard side, causing the vessel to shake.
30. After determining the vessel was hard aground, the Master directed the Chief Engineer (C/E) to shut down the main engine. By 2320, the auxiliary engines shut down due to a loss of cooling water and the emergency generator was started.
31. The Master directed the C/E to check the machinery spaces for flooding. The shaft tube and the sludge tank were both leaking. The Master, in consultation with the C/E, ordered the contents of the sludge tank be transferred to an intact tank after determining there was no water ingress into the hull or leakage from any of the other tanks. In addition, both anchors were released.
32. Approximately one hour after OU YA LENG 6 went aground, one of the vessel's lifeboats and one of the liferafts were launched.¹⁵ The liferaft was seen to go aground after being launched. The lifeboat was immediately recovered.
33. Soundings were then taken around the vessel. The water depth off the starboard bow was 0.9 m, 1.1 m midships, and 2.5 m aft. The vessel was reported to be on an even keel (*see Figure 4*).



Figure 4: OU YA LENG 6 aground on Taka Atoll on 3 January 2019. The object off the vessel's starboard side is one of the liferafts. (Source: US Coast Guard)

¹⁵ It was not reported from which side of the vessel the lifeboat and liferaft were launched.

34. At 0630 on 4 January 2019, the PRC-registered fishing vessel SHEN LIAN CHENG 737 arrived on scene with OU YA LENG 6. One of OU YA LENG 6's lifeboats was launched but went aground. The second liferaft and two rafts constructed by the crew were launched. At 0825, the Master ordered the crew to abandon ship. After three unsuccessful attempts to pass through the breakers at the reef edge, during which the second liferaft was damaged, the Master ordered the crew to return to the vessel. By 1150, all 24 crewmembers were safely back on board.
35. At 0600 on 5 January 2019, a Republic of the Marshall Islands patrol vessel arrived on scene with OU YA LENG 6. At approximately 0800 a skiff was launched from the patrol vessel and went alongside to begin evacuating the crewmembers to the patrol vessel. By 0900, 22 crewmembers safely disembarked by the patrol vessel to SHEN LIAN CHENG 737 and two crewmembers, including the Master, were safely disembarked to the patrol vessel.

Crew Experience

36. For their positions on board, all seven officers held valid documents issued by the PRC, certifying they met the requirements of national laws and regulations, and the IMO's International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel, 1995 (STCW-F). The ratings each held valid seafarer books issued by either the PRC or the Republic of Indonesia indicating they were qualified to work on board fishing vessels. These books did not include a statement indicating in which capacity they were qualified to serve.¹⁶
37. The STCW-F required the Master and duty OOW to know how to determine a vessel's position using terrestrial observations and electronic navigational equipment. The Master was also required to know the limitations and sources of error in this equipment. Both were also required to understand how to use radar equipment and interpret the information obtained, including the identification of critical echoes.¹⁷
38. The STCW-F also requires that the duty OOW monitor the vessel's position using available navigation aids to ensure the vessel follows the planned route.¹⁸
39. The Master reported he had sailed as Master of different types of fishing vessels for 30 years. He had sailed as Master of OU YA LENG 6 for three years and most recently joined the vessel on 25 June 2018.
40. The 3/O stated he first went to sea in 1998 and had sailed on fishing trawlers and reefer carriers. He had worked as a fisherman on vessels operated by the Owner from 2011–2016. He first sailed as 3/O in December 2017. He most recently joined OU YA LENG 6 on 25 June 2018.
41. The rating who was on duty as lookout joined OU YA LENG 6 on 11 December 2018. This was his first trip to sea.

Consequences

42. On 26 March 2019, OU YA LENG 6 remained stranded on Taka Atoll and was declared a total constructive loss.

¹⁶ All the officers and nine of the ratings were Chinese nationals and eight of the ratings were Indonesian nationals.

¹⁷ See STCW-F, Chapter II, regulations 1 and 2.

¹⁸ See STCW-F, Chapter IV, regulation 4.3.2.

43. The grounding of OU YA LENG 6 physically damaged approximately 18,600 square meters (m²) of environmentally sensitive subtidal and intertidal reef.¹⁹
44. After grounding, about 155-160 tons of fuel oil leaked from the vessel's tanks onto the reef and surrounding waters. The oil spill is estimated to have damaged 1,243,000 m² of subtidal and intertidal reef.²⁰
45. The fuel spill and damage to the reef resulted in corresponding adverse impacts to fragile marine life in the area.²¹

PART 3: ANALYSIS

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

Grounding

Based on the statements of the Master and the duty OOW, soundings taken around the hull and photographs taken during the day on 3 January 2019, OU YA LENG 6 went hard aground on Taka Atoll. There is no indication that there was a loss of propulsion, electrical power, or steering prior to the grounding. In addition, all navigation equipment was reported to be working properly. This indicates the causes of the grounding were issues related to the voyage planning and navigation watchstanding.

Navigation Equipment

OU YA LENG 6 was equipped with one HM-5817 ECS and small-scale paper charts of the Pacific Ocean. The lack of a second ECS or appropriately scaled paper charts did not provide the vessel adequate back up in the event the ECS failed.²² Further, based on the type approval certificate issued by CCS, the HM-5817 is intended for use on commercial vessels operating on coastal or inland waters, not those operating on the high-seas. This is an indication that the Owners of OU YA LENG 6 did not appropriately equip the vessel for safe navigation on an ocean voyage.

It was reported that all of OU YA LENG 6's navigation equipment was working properly and was available to the OOW to monitor the vessel's position and to identify any potential hazards to navigation on the night of 2 January 2019.

It is the responsibility of the vessel's Owner and Master to ensure that it was provided with appropriate charts. OU YA LENG 6's electronic charts were small scale ocean navigation charts unsuitable for coastal navigation with limited details, they did not include any navigational warnings, and were not intended for use on a commercial vessel. In addition, Taka Atoll and the surrounding waters are not shown in sufficient

19 Republic of the Marshall Islands Environmental Protection Authority, "2nd Benthic Coral Reef Damaged Assessment: OU YA LENG 6 Vessel Grounding Northwest Taka Atoll, Marshall Islands," p. 9 (dated 6 September 2019).

20 *Ibid.*

21 *Ibid.*, pp. 19-33.

22 Cargo ships of similar size as OU YA LENG 6 that are equipped with ECDIS are required by SOLAS regulation V/19.2.5 to have adequate back-up arrangements in case the ECDIS fails. Such back-up arrangements include a second ECDIS or appropriate paper charts.

detail on the paper charts that were on board to ensure safe navigation in the vicinity of the atoll. The best scale ENC and paper chart for this area are GB200761 and No. 761. Both are intended for ocean navigation and for use on board commercial vessels. As previously stated, the HM-5817 can display ENCs so it would have been possible for OU YA LENG 6 to use GB200761. This is an indication that the vessel's Owner and Master did not ensure the vessel was provided with the best available charts for the intended voyage.

Voyage Planning

The Master planned the route for the voyage from Zhoushan to the fishing grounds in the southeastern Pacific Ocean on the vessel's ECS. The planned route began offshore Zhoushan and consisted of six waypoints, the last one was waypoint No. 6. This waypoint was located approximately 9 NM to the west-northwest of Taka Atoll. The proximity of waypoint No. 6 to Taka Atoll and the small scale of the charts being used for navigation required additional attention be given as OU YA LENG 6 approached this waypoint.

The voyage plan developed by the Master did not include guidance for the vessel's OOWs regarding anything other than the locations of the six waypoints and courses to steer. Notably, the Master had not updated the planned route to include any segments beyond waypoint No. 6. Also, he did not give the duty OOW any instructions to monitor the vessel's position on a regular basis nor provide an indication of his intentions once OU YA LENG 6 reached this waypoint or the need to verify the vessel's position when landfall was made. Given the small scale of the available charts and the proximity of Waypoint No. 6 to Taka Atoll, the absence of such guidance increased the risk of grounding on Taka Atoll.

Navigation Watchstanding

In accordance with STCW-F, Chapter IV, the duty OOW is responsible for the safe navigation while on watch and is expected to make use of all available navigational aids to monitor the vessel's position while executing the planned voyage.

The islets forming Taka Atoll are low lying. Given the weather conditions prevailing on the night of 2 January 2019, it may have been difficult to detect the islets forming Taka Atoll accurately on radar. However, monitoring the vessel's position regularly on the ECS would have allowed the duty OOW to alter course or call the Master in sufficient time to avoid the grounding.

The duty OOW stated that he was focused on the weather conditions and was not monitoring either the time or the vessel's position. As a result, he did not call the Master at 2200 as directed. He was also not aware that OU YA LENG 6 had passed waypoint No. 6 and was closing on Taka Atoll. Further, he did not check the radar or ECS when he saw something ahead of the vessel at 2230. As a result, he remained unaware that OU YA LENG 6 was approaching Taka Atoll and at risk of going aground. This is an indication of an ineffective navigational watch.

The HM-5817 ECS was capable of automatically monitoring the vessel's position and activating an alarm when it was off the planned route or approaching a waypoint. Although automated monitoring of the position of a vessel does not relieve the duty OOW of his or her responsibility for safe navigation while on watch,

these alarms provide an additional safeguard that can improve the safety of navigation. As previously stated, neither alarm had not been set-up. This is an additional indication of an ineffective navigational watch and of ineffective use of the vessel's navigation equipment.

Human Factors

The duty OOW was required by the STCW-F to have knowledge of how to determine a vessel's position using terrestrial observations and electronic navigational equipment and to use all available equipment to ensure the vessel followed the planned route. The fact the duty OOW was focused on the weather and did not check the vessel's position on the ECS is an indication that his training may not have been sufficient to ensure he was capable of standing an effective navigational watch. It is also an indication that the Master did not provide adequate supervision.

PART 4: CONCLUSIONS

These 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 vessel was provided with inadequate navigation equipment for safe navigation on an ocean voyage, by the Owner;
 - (b) the vessel was provided with small scale, poor quality electronic charts that were not intended for use on board commercial vessels;
 - (c) ineffective voyage planning by the vessel's Master;
 - (d) ineffective navigation watchstanding by the duty OOW;
 - (e) ineffective use of the vessel's navigation equipment by the Master and duty OOW; and
 - (f) the duty OOW may have received insufficient training and supervision by the vessel's Master to stand a navigational watch.

PART 5: PREVENTIVE ACTION

In response to this very serious marine casualty, the Owner has taken the following Preventive Action.

The lessons learned have been shared with the Owner's other vessels to enhance the awareness of Masters' and crew regarding the duties of bridge watchstanders and general safety management.

PART 6: RECOMMENDATIONS

The following Recommendations are based on the above Conclusions and in consideration of the Preventive Action taken.

1. The Owner ensures its vessels are fitted with adequate navigation equipment and charts, including electronic charts if used as the primary means of navigation, that are intended for use on board commercial vessels operating on the high seas.
2. The Owner develops procedures for voyage planning and navigation watchstanding, taking into consideration the IMO's Guidelines for Voyage Planning,²³ and the basic principles for keeping a navigational watch outlined in the STCW-F, Chapter IV.
3. The Owner requires the Master and duty OOW to receive additional training for navigation watchkeeping.
4. The Owner develops guidance for Masters serving on board its vessels regarding supervision of duty OOWs.

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

²³ IMO Assembly Resolution A.893(21).