ACCIDENT REPORT

Report on the investigation of the collision

between the container ship ***Ever Smart***

and the oil tanker ***Alexandra 1***

Jebel Ali, United Arab Emirates

11 February 2015

MAIB

MARINE ACCIDENT INVESTIGATION BRANCH

SERIOUS MARINE CASUALTY REPORT NO 28/2015 DECEMBER 2015

Extract from

The United Kingdom Merchant Shipping

(Accident Reporting and Investigation)

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For all enquiries:
Marine Accident Investigation Branch
Spring Place
105 Commercial Road
Southampton
United Kingdom
SO15 1GH

Email: maib@dft.gsi.gov.uk
Telephone: +44 (0) 23 8039 5500
Fax: +44 (0) 23 8023 2459

Press enquiries during office hours: 020 7944 4312 / 3176
Press enquiries out of hours: 020 7944 4292

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AB	-	Able Seaman
AIS	-	Automatic Identification System
ARPA	-	Automatic Radar Plotting Aid
BTM	-	Bridge Team Management
CEC	-	Certificate of Equivalent Competency
CoC	-	Certificate of Competency
COLREGS	-	International Regulations for Preventing Collisions at Sea 1972 (as amended)
ECDIS	-	Electronic Chart Display and Information System
EMU	-	Evergreen Marine (UK) Limited
IALA	-	International Association of Marine Aids to Navigation and Lighthouse Authorities
IMO	-	International Maritime Organization
INS	-	Information Service
kt	-	knot
kW	-	kilowatt
m	-	metre
NAS	-	Navigational Assistance Service
nm	-	nautical mile
rpm	-	revolutions per minute
SOG	-	Speed Over the Ground
SOLAS	-	International Convention for the Safety of Life at Sea 1974, as amended
STCW	-	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978, as amended (STCW Convention)
t	-	tonne
TOS	-	Traffic Organisation Service

UAE	-	United Arab Emirates
UK	-	United Kingdom
UTC	-	Universal Co-ordinated Time
VDR	-	Voyage Data Recorder
VHF	-	Very High Frequency
VTS	-	Vessel Traffic Services
VTSO	-	Vessel Traffic Service Officer

TIMES: all times used in this report are UTC+4 unless otherwise stated

SYNOPSIS

On 11 February 2015, the United Kingdom registered container ship *Ever Smart* collided with the Marshall Islands registered oil tanker *Alexandra 1* near the entrance to the buoyed approach channel in Jebel Ali, United Arab Emirates. The container ship was outbound at a speed of 12 knots and had disembarked its pilot. The tanker was inbound and was moving very slowly ahead while waiting for the pilot from the container ship to board. Both vessels suffered major structural damage to their bows but there were no injuries or pollution.

The collision resulted from several factors. In particular, a passing arrangement was not agreed or promulgated and the actions of both masters were based on assumptions. *Alexandra 1* was unnecessarily close to the channel entrance and the tanker's master acted on scanty VHF radio information. In addition, *Ever Smart*'s bridge team did not keep a proper lookout or monitor the tanker's movement. They only realised that *Alexandra 1* was close ahead seconds before the collision when alerted by the port control.

The accident occurred within Jebel Ali's port limits. The precautions of pilotage and the port's vessel traffic service, which would normally co-ordinate and de-conflict the movements of vessels in the port area, were ineffective on this occasion.

Evergreen Marine (UK) Limited, the managers of *Ever Smart* and Iships Management Private Limited, the managers of *Alexandra 1* have taken action to improve the standard of bridge watchkeeping on board their vessels. A recommendation to DP World UAE Region, the operators of Jebel Ali port, is intended to improve the effectiveness of the vessel traffic and pilotage services it provides.

SECTION 1 – FACTUAL INFORMATION

1.1 PARTICULARS OF *EVER SMART*, *ALEXANDRA 1* AND ACCIDENT

SHIP PARTICULARS		
Vessel's name	*Ever Smart*	*Alexandra 1*
Flag	United Kingdom	Marshall Islands
Classification society	Lloyd's Register	Det Norske Veritas
IMO number	9300403	9127148
Type	Container ship	Crude oil tanker
Registered owner	Evergreen Marine (UK) Limited	Nautical Challenge Limited
Manager	Evergreen Marine (UK) Limited	Iships Management Private Limited
Construction	Steel	Steel
Year of build	2005	1997
Length overall	299.99m	269.19m
Gross tonnage	75246	79779
Minimum safe manning	16	20
Authorised cargo	Containers	Oil in bulk
VOYAGE PARTICULARS		
Port of departure	Jebel Ali, United Arab Emirates	Umm Al Qasr, Iraq
Port of arrival	Dammam, Saudi Arabia	Jebel Ali, United Arab Emirates
Type of voyage	International	International
Cargo information	48564t in containers	113973.5t condensate
Draft	12.7m	14.0m
Manning	21	28

MARINE CASUALTY INFORMATION		
Date and time	11 February 2015 1942 UTC	
Type of marine casualty or incident	Serious Marine Casualty	
Location of incident	Jebel Ali, United Arab Emirates	
Vessel's name	*Ever Smart*	*Alexandra 1*
Place on board	Bow/forecastle deck	Bow/forecastle deck
Injuries/fatalities	None	None
Damage/environmental impact	Bow severely distorted and penetrated.	Bow and forecastle deck severely damaged.
Ship operation	On passage	On passage
Voyage segment	Transit	Transit
External & internal environment	Wind: 068° at 6 knots. It was dark with clear skies and good visibility. The sea was calm with a low swell. The tidal stream was south-easterly at less than 1 knot.	
Persons on board	21	28

Image courtesy of www.shipspotting.com

Ever Smart

Image courtesy of Evangelos Patsis/www.marinetraffic.com

Alexandra 1 (under former name *Aldawha*)

1.2 NARRATIVE

1.2.1 Events leading up to the collision

During the evening of 11 February 2015, the United Kingdom (UK) registered container ship *Ever Smart* was alongside in Jebel Ali, United Arab Emirates (UAE). At 2128, the vessel's third officer contacted Jebel Ali port control by very high frequency (VHF) radio channel 69[1] and advised that cargo operations would be completed in 20 minutes. The duty vessel traffic service officer (VTSO) acknowledged the call. Details of the vessel's next port of call, pilot boarding arrangements and the number of tugs to be used for departure were exchanged.

At 2200, the inbound Marshall Islands registered oil tanker *Alexandra 1*, loaded with 113973.5t of condensate[2], anchored in the short-term anchorage off Jebel Ali **(Figure 1)** to wait for a pilot. At the same time, the VTSO called the tanker and passed instructions for the pilot's embarkation **(Table 1)**.

VTSO	*Alexandra 1 the pilot will board at about 2315 by buoy No1*
Alexandra 1 (master)	*Jebel Ali Port control this is Alexandra 1. We are now anchored, 2200.*
VTSO	*Alexandra 1 this is Jebel Ali Port control. 2315 at buoy No1*
Alexandra 1 (master)	*Roger. 2315 buoy No1. Shokran*

Table 1 – VHF radio exchange between Jebel Ali port control and *Alexandra 1* at 2200

At 2206, *Ever Smart* finished cargo operations. A pilot embarked and went to the bridge where the third officer was testing the vessel's engine in readiness for departure. The third officer and the pilot were soon joined on the bridge by the master.

The pilot was given the vessel's pilot card, which detailed its manoeuvring characteristics. The master and pilot then discussed the departure plan. The discussion included the arrangements for the pilot's disembarkation in the designated pilot boarding area **(Figure 1)**. On completion, the pilot called Jebel Ali port control and was given permission for *Ever Smart* to sail.

At 2230, *Ever Smart* was pulled off its berth by three harbour tugs. At 2242, the tugs were released and the vessel was manoeuvred towards the main channel. Hand steering was selected; an able seaman (AB) was at the helm.

At 2248 *Alexandra 1*'s master reported to Jebel Ali port control that the tanker had weighed anchor and was underway. The VTSO replied:

"*Proceed to buoy No1. Keep watch all of the time".*

Three minutes later, *Alexandra 1*'s engine telegraph was set to 'half ahead' and the tanker moved towards the entrance to the buoyed channel **(Figure 1)**. The tanker was displaying navigation lights appropriate to its length and a local signal,

[1] Unless otherwise stated, all VHF communications referred to in this report were on channel 69.

[2] Condensate – a light oil that is a low-density mixture of hydrocarbon liquids having gaseous components which remain as liquid under normal temperatures and pressures.

Reproduced from Admiralty Chart BA 3739 by permission of the Controller of HMSO and the UK Hydrographic Office.

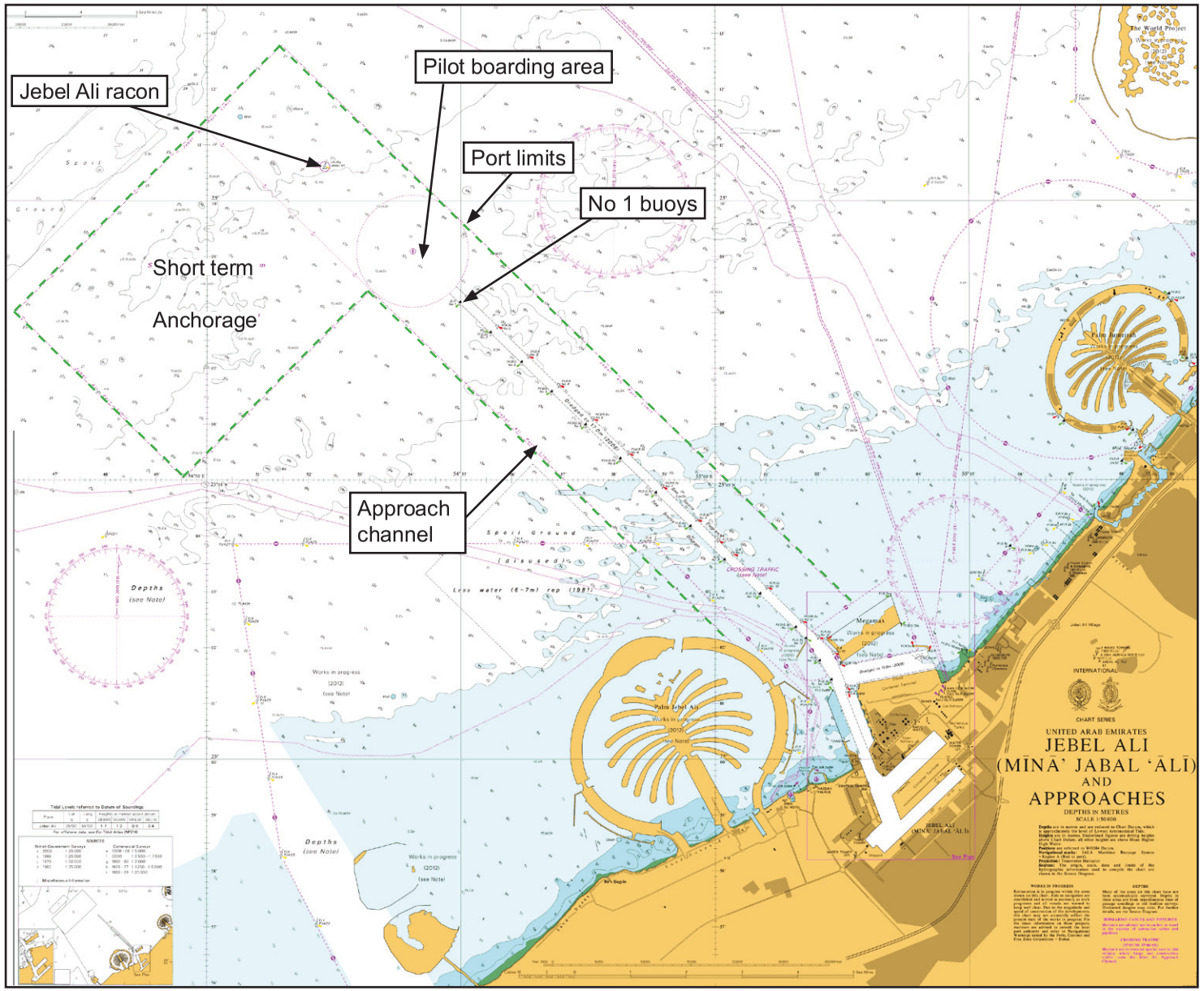

Figure 1: BA chart 3739 showing Jebel Ali port limits and short term anchorage

a flashing red light at the masthead, to indicate it was carrying a dangerous cargo. *Alexandra 1*'s master was accompanied on the bridge by the third officer and an AB. The vessel was in 'hand steering'; the AB was at the helm.

At 2253, the VTSO informed *Ever Smart*'s pilot via VHF radio of two inbound vessels. He also asked him to board *Alexandra 1* and pilot the tanker to its allocated berth. The pilot acknowledged the VTSO's request and advised that *Ever Smart* would remain in the channel until clear of the No1 buoys **(Table 2)**.

VTSO	*[pilot's name] this is Jebel Ali port control. One vessel approaching C buoy. Second vessel by buoy 6 – Viking Emerald.*
Pilot	*Jebel Ali port control this is [pilot's name]. One vessel inbound approaching C buoy. Port to port. Second vessel by buoy 6 – Viking Emerald.*
VTSO	*Jebel Ali port control [pilot's name] Please board Alexandra 1. Draught 14m. Board to 9A.*
Pilot	*9A okay. My ship Ever Smart will continue to buoy No1.*

Table 2 – VHF radio exchange between Jebel Ali port control and the pilot at 2253

The VTSO then immediately called *Alexandra 1* and he advised that the tanker's pilot was on board *Ever Smart*. He also authorised the tanker to enter the channel as soon as the container ship was clear of the No1 buoys **(Table 3)**.

VTSO	*Alexandra 1 Jebel Ali port. Captain, your pilot is on the outbound Ever Smart, passing buoy 12 and the Ever Smart will continue to buoy No1. They will be doing a good speed. Once Ever Smart is clear then you can enter the channel.*
Alexandra 1 (Master)	*Roger, sir, copy that. Coming close 1nm to buoy No1. Will wait until other vessel leave the channel thank you.*

Table 3 – VHF radio exchange between Jebel Ali port control and *Alexandra 1* at 2256

At 2302 *Ever Smart* passed the inbound cargo vessel *Trinityborg*. Seven minutes later, the container ship passed the inbound car carrier *Viking Emerald* **(Figure 2)**. *Ever Smart* was making good a speed over the ground (SOG)[3] of 12 knots (kts).

At 2312, *Alexandra 1*'s master saw by radar that *Ever Smart* was passing No8 buoys. He selected the container ship's radar target using the automatic radar plotting aid (ARPA), which enabled him to monitor its progress. The master realised that *Ever Smart* would not be clear of the channel for some time and at 2314 he set the engine telegraph from 'dead slow ahead' to 'stop'. The tanker was drifting on an easterly heading 1.3nm from No1 buoys and the master was frustrated at being off the channel entrance earlier than was necessary.

At 2319, *Alexandra 1*'s master called Jebel Ali port control and confirmed the requirements for the pilot ladder. By now, the tanker was 1.058nm from No1 buoys, making good a course over the ground of 126° at 2.2kts.

At 2328, *Alexandra 1*'s engine telegraph was set to 'dead slow ahead'. One minute later, the tug *Zakheer Bravo* called Jebel Ali port control by VHF radio and requested permission to cross the pilot embarkation area. The tug and its tow were 1.3nm to

[3] All speeds are SOG unless otherwise stated.

Image courtesy of Jebel Ali Port

Figure 2: VTS radar showing *Ever Smart*'s position at 2309

the west of No1 buoys **(Figure 3)** and were on passage to Jumeirah to the east of Jebel Ali. The VTSO asked the tug's skipper "*can you see the big tanker waiting?"* The tug's skipper advised that he could and the VTSO instructed him to "*cross 1nm astern of the tanker*".

Alexandra 1's master heard part of this radio exchange and assumed that Jebel Ali port control was talking to *Ever Smart*. The master assessed that in order to pass astern of his vessel, *Ever Smart* would alter course to port on clearing the channel.

At 2331, as *Ever Smart* was approaching No3 buoys, the pilot and the master discussed the pilot's disembarkation **(Table 4)**. At 2332, *Alexandra 1*'s engine telegraph was set to 'stop'. The tanker was 7.7 cables from the channel entrance at a speed of 1.8kts and maintaining a heading of 100°.

Pilot	*So captain, the time has come for me to go. Just follow the channel*
Master	*Do you think I can go myself?*
Pilot	*Yes, yes. There is this coming now. There is just the one ship. Only this tanker*
Master	*Yes, yes*
Pilot	*It's coming. It will wait…. Anyway I go there before ….okay captain*
Master	*Yes, yes*

Table 4 – Conversation between the pilot and *Ever Smart*'s master at 2331

Image courtesy of Jebel Ali Port

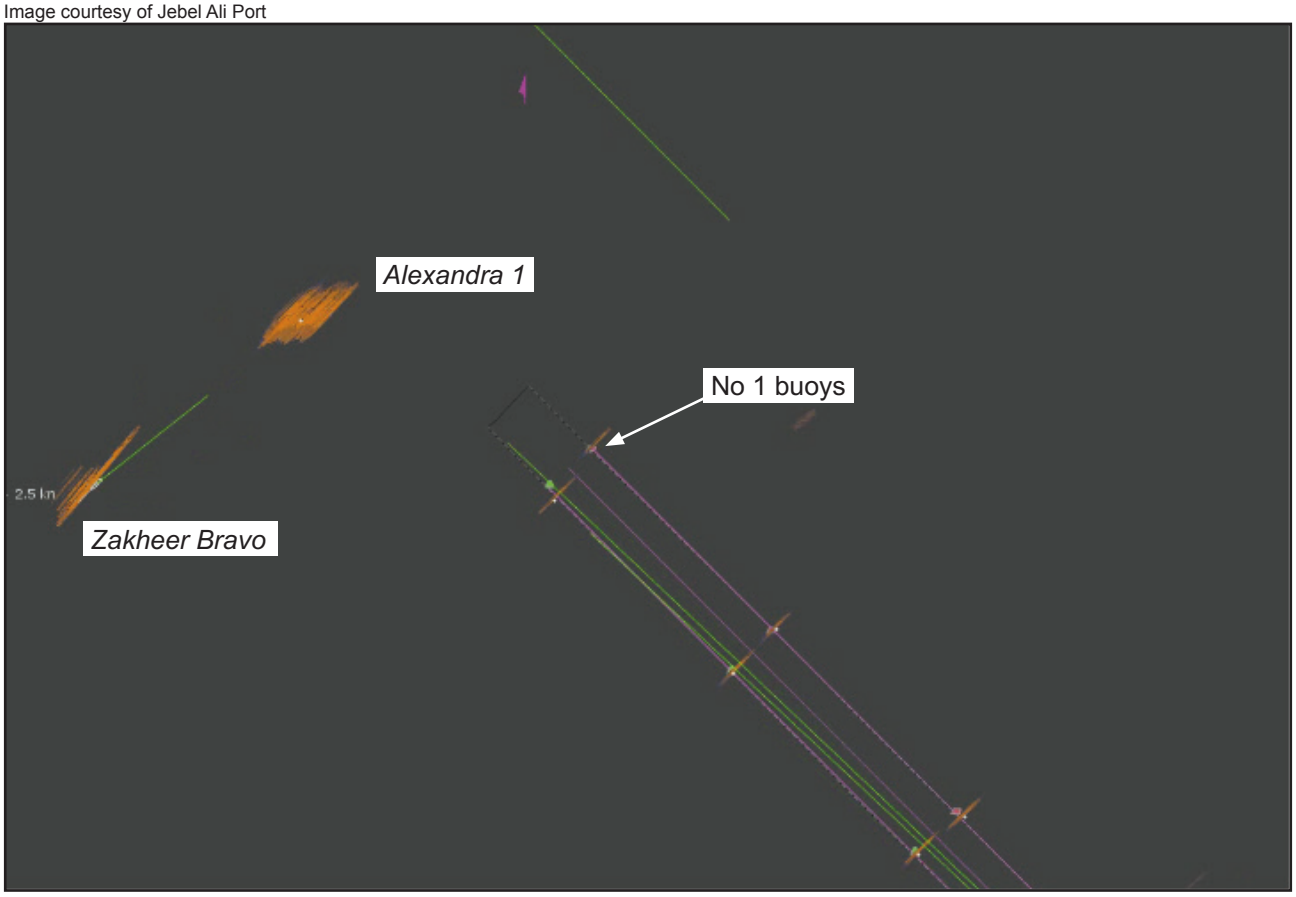

Figure 3: VTS radar showing *Zakheer Bravo* and *Alexandra 1* at 2329

Alexandra 1 was visible from *Ever Smart*'s bridge. The tanker was also on the radar displays but it was not acquired as an ARPA target **(Figure 4)**.

At 2334 *Alexandra 1*'s engine telegraph was again set to 'dead slow ahead'. At about the same time, the pilot advised *Ever Smart's* master to reduce speed to 10kts and to maintain a course over the ground of 314°. He also reminded the master of the tanker waiting to the west of the entrance to the buoyed channel; *Alexandra 1* was 0.7nm from the No1 buoys. The pilot then left the bridge, accompanied by the third officer. The master ordered the helmsman to steer 319° and adjusted the port radar display **(Figure 5)** to 'north-up' **(Figure 6)**. By eye, he estimated that the tanker would pass down the container ship's port side at a distance of 1.5 cables.

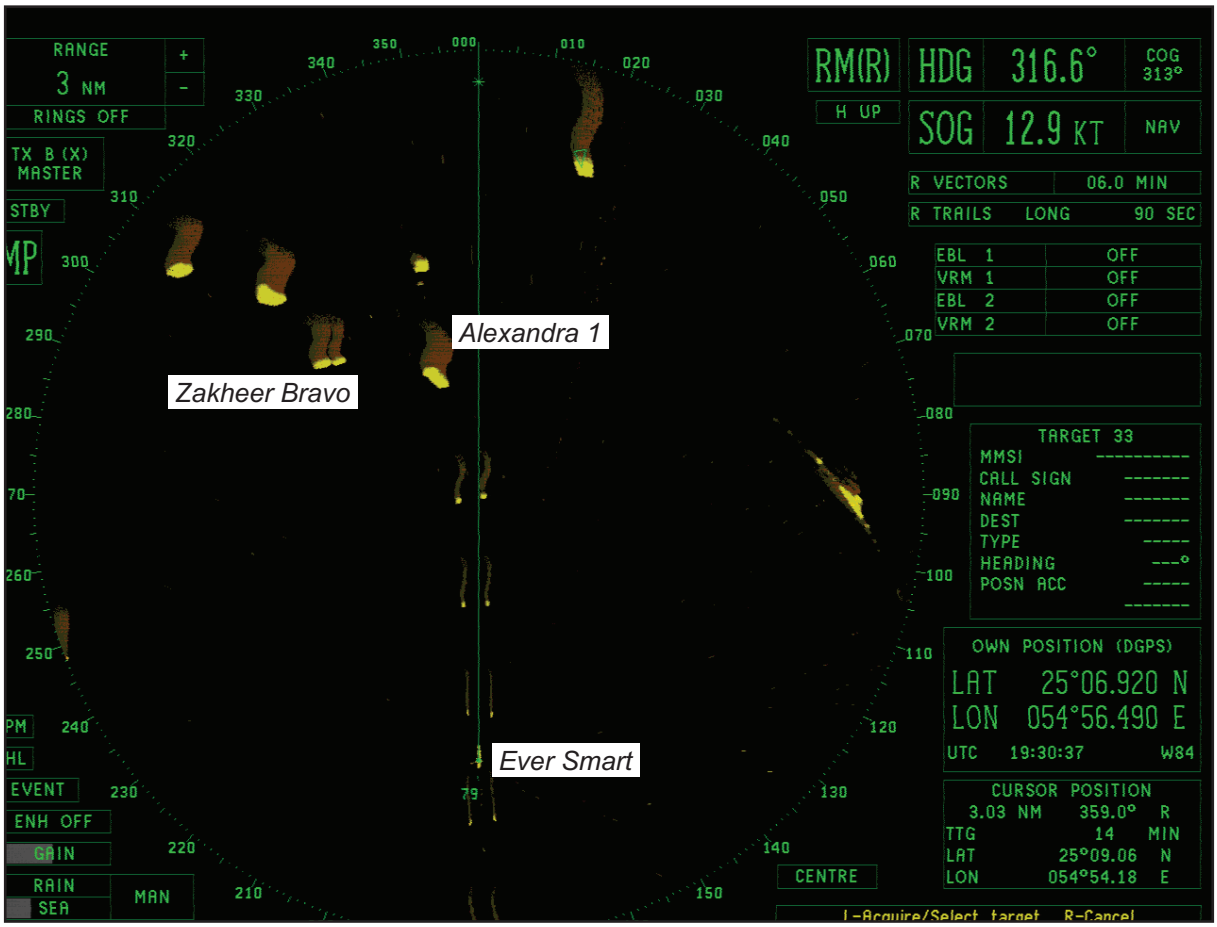

Figure 4: *Ever Smart* – port radar display at 2331

At 2337, as *Ever Smart* passed between the No2 buoys **(Figure 7)**, the pilot launch with the pilot on board cleared the container vessel's port side and headed towards *Alexandra 1*. *Ever Smart*'s master immediately increased the vessel's engine speed. At the same time, *Alexandra 1*'s master confirmed to the pilot launch via VHF radio that the pilot ladder was rigged on the tanker's starboard side.

1.2.2 The collision

At 2340, *Alexandra 1*'s master moved the engine telegraph from 'dead slow ahead' to 'slow ahead'; the tanker's speed was about 2kts and it remained on an easterly heading. Approximately 30 seconds later, *Ever Smart* passed between the No1 buoys at a speed of 11kts **(Figure 8)**. The container ship's third officer returned to the bridge and, on instruction from the master, he rang 'full away' with an engine setting of 80rpm. He then started to collect information required to fill in the deck log. The helmsman continued to steer 319°.

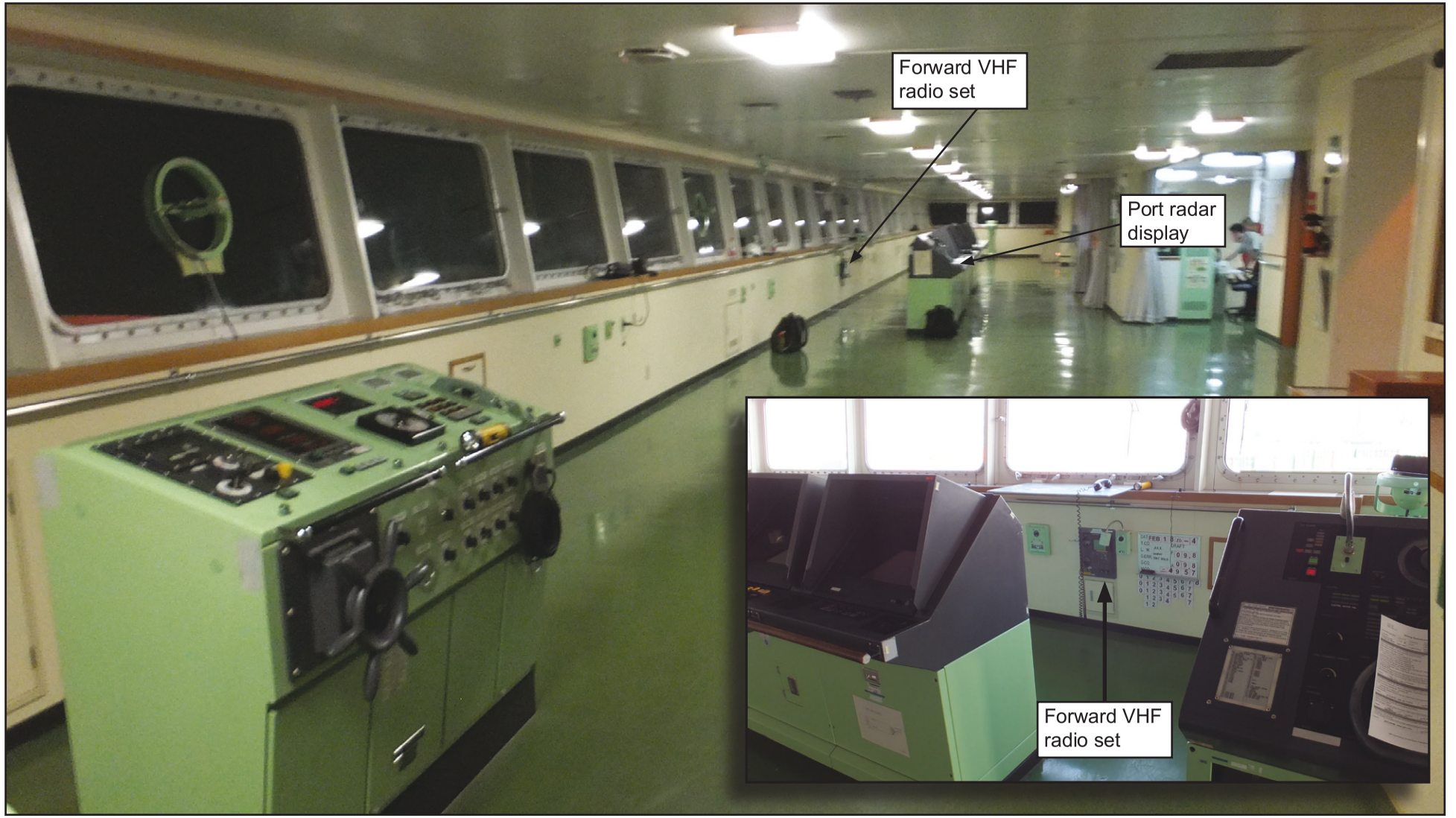

Figure 5: *Ever Smart* bridge (**insert:** The forward VHF radio set on *Ever Smart*'s bridge)

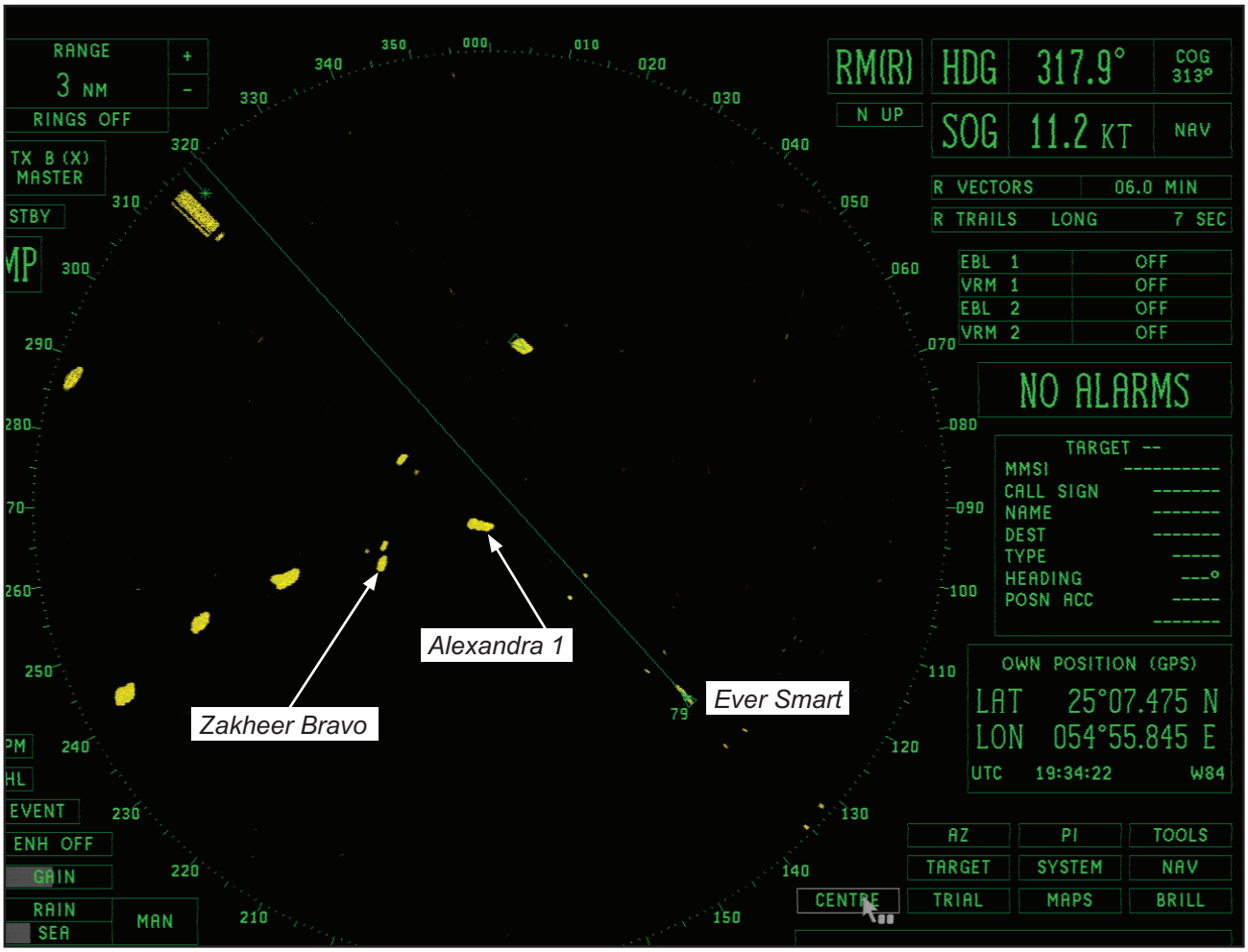

Figure 6: *Ever Smart* – port radar display at 2334

Alexandra 1's master saw *Ever Smart* pass between the No1 buoys and became concerned that the container ship had not altered course to port as he had expected. At 2341:28, *Alexandra 1*'s master called Jebel Ali port control on the VHF radio **(Table 5)**.

2341:28	*Alexandra 1* (Master)	*Jebel Ali port control this is Alexandra 1 come in. Container not changing course. This is collision*
	VTSO	*I told him. Are they clear of buoy No1 then you will be entering the channel I said*
	Alexandra 1 (Master)	*He's going to collision to me now!*

Table 5 – VHF radio exchange between *Alexandra 1* and Jebel Ali port control at 2341

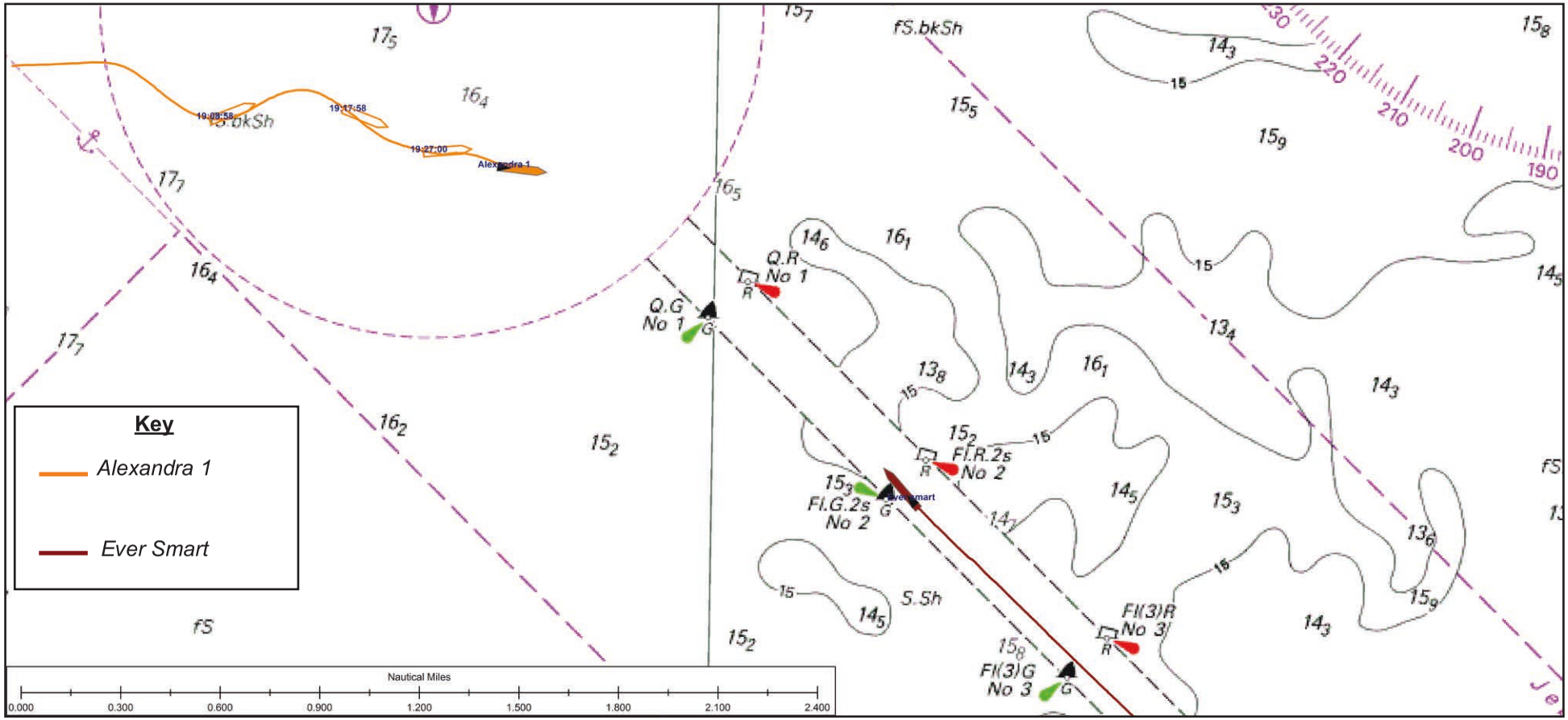

Figure 7: Plot showing the vessels' positions at 2337

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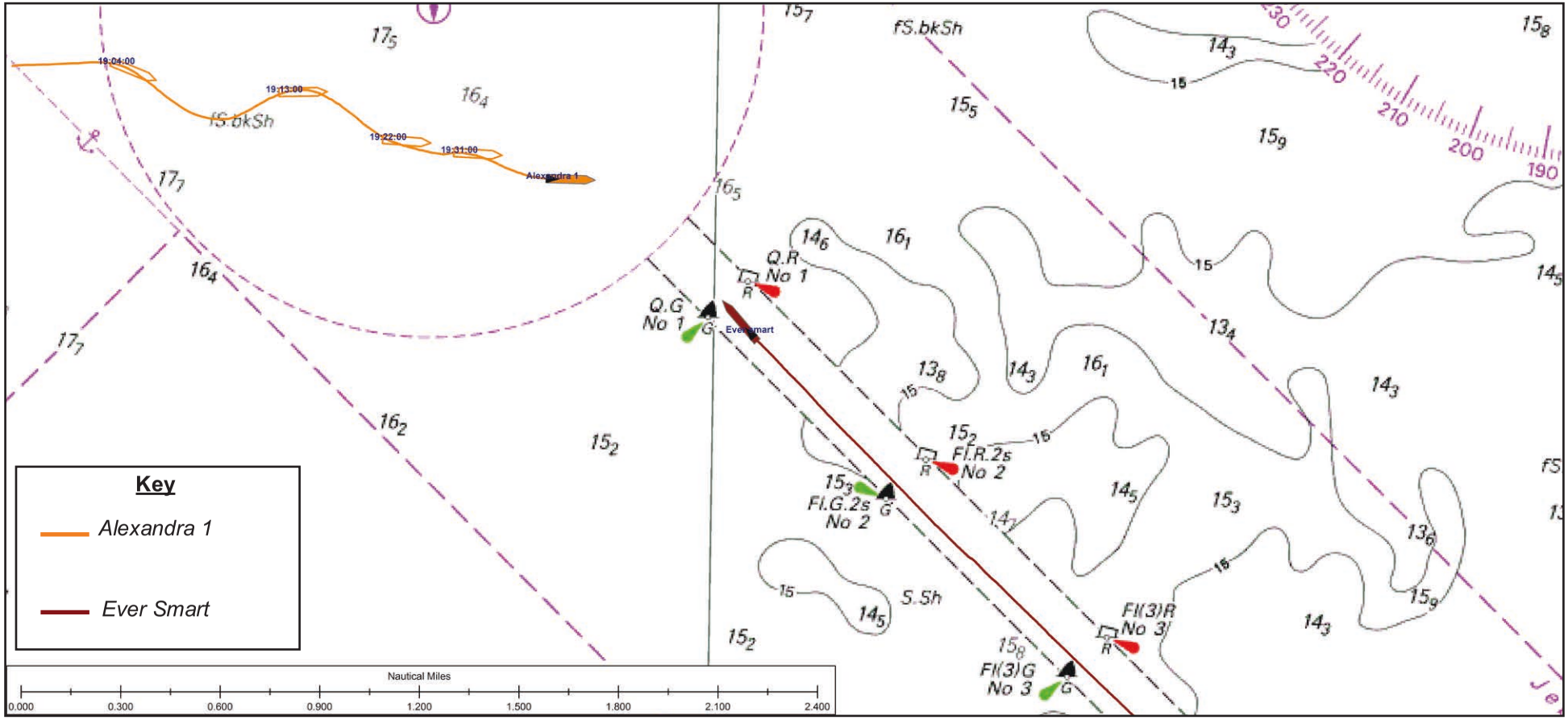

Figure 8: Plot showing the vessels' positions at 2340

The VTSO immediately called *Ever Smart*. The pilot, who was still on board the pilot launch and *Alexandra 1*'s master also intervened **(Table 6)**.

2341:48	VTSO	*Ever Smart this is Jebel Ali port*
2341:52	*Ever Smart* (third officer)	*Jebel Ali port this is Ever Smart. Good morning ...*
2341:55	VTSO	*Are you clearing to starboard please? We have the tanker there coming to enter the channel… [overspoken]*
2341:55	Pilot	*Ever Smart, Hard to starboard! Hard to starboard! Hard to starboard!*
2342	*Alexandra 1* (master)	*Hard to ******** starboard Hard to starboard. Ever Smart hard to starboard.*

Table 6 – VHF radio exchange between Jebel Ali port control, *Ever Smart*, the pilot and *Alexandra 1* at 2341 (continued)

During these VHF transmissions, *Alexandra 1*'s engine telegraph was set to 'full astern'; the tanker's deck lights and external accommodation lights were also switched on. At 2342:12, *Ever Smart*'s master ordered '*OK hard to starboard'*. He then exclaimed "*what's that?*" Three seconds later, at 2342:19, *Ever Smart* and *Alexandra 1* collided bow to bow **(Figures 9, 10** and **11)**. The vessels were 4 cables from the No1 buoys.

Figure 9: *Ever Smart* – port radar display at 2342:07

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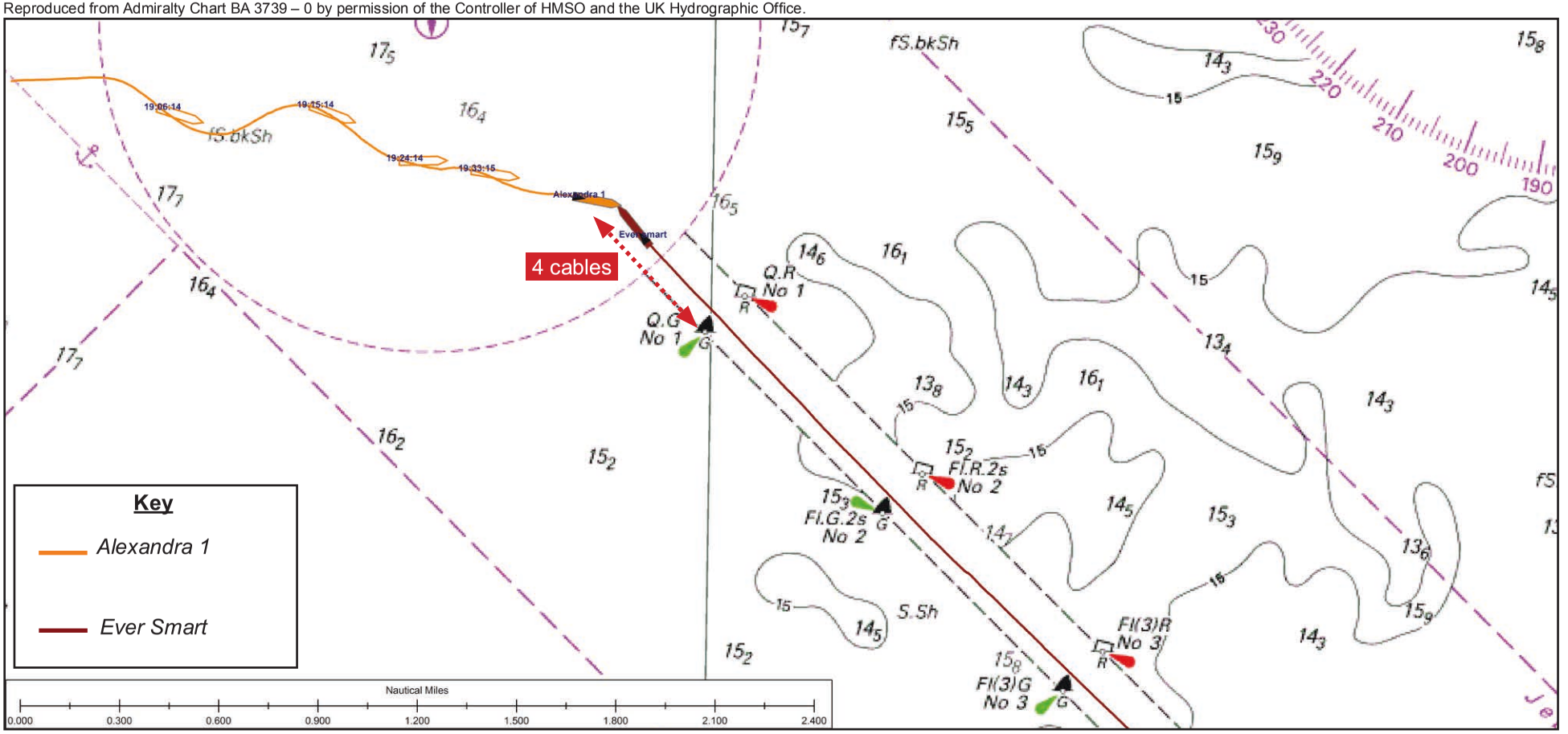

Figure 10: Plot showing the collision at 2342

Figure 11: *Ever Smart* and *Alexandra 1* shortly after the collision

1.2.3 Post-collision actions

Alexandra 1

Alexandra 1's master immediately reported the collision to Jebel Ali port control by VHF radio and stated:

> *'He's not following your rules, you told him to go by my stern.'*

Alexandra 1 remained at 'full astern'. The general alarm was not sounded but the tanker's officers immediately went to the bridge and quickly accounted for all of the crew and determined that none were injured. The voyage data recorder (VDR) data was saved.

At 2348, *Alexandra 1* and *Ever Smart* separated and the tanker's master set the engine telegraph to 'stop'. The chief officer and the chief engineer assessed the damage and established that there was water ingress into the forepeak tank.

Ever Smart

Immediately following the collision, *Ever Smart*'s third officer also informed Jebel Ali port control of the accident. The container ship's engine telegraph was set to 'stop' and the emergency alarm was sounded. A crew muster was completed and the chief officer and chief engineer assessed the damage.

The third officer attempted to establish communication with *Alexandra 1* but neither he nor the container ship's master knew the tanker's name. The tanker's identity was eventually established through Jebel Ali port control. The VDR data was saved.

1.3 DAMAGE

1.3.1 *Alexandra 1*

Alexandra 1's bow was split vertically from the main deck to below the waterline **(Figure 12)**. The tanker was not permitted to enter the port and was unable to anchor due to the extensive damage to its forecastle and deck equipment. The collision bulkhead was not penetrated and there was no pollution.

The tanker remained underway off Jebel Ali and Dubai until its condensate cargo was transhipped at sea to other vessels. The tanker arrived in Dubai for permanent repair in April 2015.

1.3.2 *Ever Smart*

Ever Smart sustained considerable structural damage forward of its collision bulkhead. The bow was distorted and the hull plating was severely indented and holed **(Figure 13)**. Following temporary repairs in Dubai, *Ever Smart* proceeded to Ningbo, China for permanent repairs.

Figure 12: *Alexandra 1*'s damaged bow

Figure 13: *Ever Smart*'s damaged bow

1.4 *EVER SMART*

1.4.1 Management and operation

The UK registered container ship *Ever Smart* was one of 20 container ships managed by Evergreen Marine (UK) Limited (EMU), and was trading on a liner service between the Far East and the Red Sea. The vessel was manned by a mix of Filipino, Taiwanese and Chinese crew; the working language on board was English. EMU is based in London and markets its container services under the brand name 'Evergreen Line', together with Evergreen Marine Corp (Taiwan) Limited, Evergreen Marine (Hong Kong) Limited, Italia Marittima S.p.A and Evergreen Marine (Singapore) Pte Limited.

1.4.2 The master

Ever Smart's master was 57 years of age and was a Taiwanese national. He held a Chinese STCW II/2 certificate of competency (CoC) with a UK certificate of equivalent competency (CEC). The master had been employed by Evergreen since 1992 and had served as master for 3½ years. This was his third contract on board *Ever Smart* and he had been on board for 4½ months. The master was well rested and did not drink alcohol. He had never previously visited Jebel Ali.

The training courses attended by the master that were connected with navigation and bridge management included:

- Human element, leadership and management – August 2014
- Ship handling – August 2014
- Electronic chart display and information system (ECDIS) – November 2013
- Radar navigation and ARPA – October 2001
- Bridge team management (BTM) – October 2001

1.4.3 Bridge equipment and visibility

Ever Smart's primary means of navigation was paper charts but an ECDIS was available for reference. The container ship was fitted with two X band radars, and one S band radar, but only the X band radars were operating. The port radar display **(Figures 6** and **9)** was used by the pilot and the master and was set on the 3nm range scale. The display was in relative motion and was off-centred to extend the coverage ahead of the vessel to about 4.5nm. The third officer monitored the starboard radar display, which he switched between the 3nm and 6nm range scales. It was onboard practice to use AIS data on the radar displays for collision avoidance rather than ARPA.

Two VHF radios were sited towards the centreline. When answering the VHF call from Jebel Ali port control at 2341, the third officer used the radio handset sited at the front of the bridge **(Figure 5)**.

Ever Smart was carrying 1973 containers on deck, which were stacked seven containers high. In this condition, a 'shadow zone' of 485m immediately ahead of the vessel was not visible from the bridge.

1.4.4 Manoeuvrability

Ever Smart was fitted with a semi-balanced rudder with a maximum angle of 35° to port or starboard. The manoeuvring data available indicated that when loaded at a speed of 15kts, the container ship was able to complete a 360° turn to starboard with an advance of 770m and transfer of 370m in 2 minutes and 30 seconds.

1.5 *ALEXANDRA 1*

1.5.1 Management and operation

The Marshall Islands registered crude oil tanker *Alexandra 1* (previously named *Aldawha*), was one of four oil tankers managed by Iships Management Private Limited, based in Singapore. The vessel's crew were mainly Russian but a number were also Georgian or Ukrainian. The tanker operated in the Persian Gulf and discharged its cargo in Jebel Ali every 7 to 10 days. The tanker had anchored in the port's short-term anchorage between 0500 and 1606 on 11 February 2015. It had then drifted while waiting for a pilot, until anchoring again at 2200.

1.5.2 The master

Alexandra 1's master was 44 years of age and a Russian national. He held an STCW II/2 CoC with a Marshall Islands CEC. He last attended a BTM course in 2011.

The master had served on board tankers throughout his career and had served as master for 3 years. He was nearing the completion of his second contract in command of *Alexandra 1*. The master had previously called into Jebel Ali on 19 occasions on board the tanker and had prepared handover notes on the port for his relief. These included:

> ***ON ARRIVAL JEBEL ALI PILOT STATION:***
>
> ***Strictly follow all instructions from Control 69***
>
> ***2 hrs/ f/b 1 hrs and etc. notices B4 arrival. Always permission for all your action to be granted in advance from Control 69. No any argue. Change course and speed, drifting area, proceeding to pilot or anchor station.***
>
> ***If request to keep 1.5NM from buoy no.1 it means not less even 1 CBL***
>
> [sic] [emphasis original]

1.5.3 Bridge equipment

Alexandra 1's bridge equipment included X and S band radar displays that were set on the 6nm range scale. The displays were centred, 'north-up' and in true motion. ARPA was used for collision avoidance. The vessel's AIS was switched off. The primary means of navigation was paper charts.

1.5.4 Manoeuvrability

Alexandra 1 was fitted with a semi-balanced rudder with a maximum angle of 35° to port or starboard. When loaded, the tanker required a speed of over 4kts to maintain steerage. A load programme led to a delay between the setting of the engine telegraph and the engine achieving the speed intended.

1.6 JEBEL ALI PORT

1.6.1 Operation

Jebel Ali is a man-made port situated approximately 20nm west of Dubai. The port was operated by DP World UAE Region and was the largest marine terminal in the Middle East, with close to 20,000 ship movements per year. It was also the flagship facility of DP World's portfolio of over 65 marine terminals across six continents and played a vital role in the UAE economy.

1.6.2 Navigation

Jebel Ali's port limits, which encompassed the approach channel, the short-term anchorage and the pilot boarding area, are shown at **Figure 1**. The port was entered through a channel marked by pairs of lateral buoys numbered from 1 at the seaward

end to 16 near the outer basin. The approach channel was 10.9nm in length, 320m wide and was dredged to a depth of 17m. Between buoys 1 and 13, the channel's axis was 315°/135°. The mean spring tidal range in Jebel Ali was 1.3m.

1.6.3 Port control

Jebel Ali port control operated a quasi-Vessel Traffic Service (VTS)[4]. The service was aligned to, but did not meet, all of the VTS standards of the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA). DP World UAE had not formally declared its service as a VTS and it was not listed as such in maritime publications such as the Admiralty List of Radio Signals Volume 6 (NP286(8)) and the World VTS Guide[5].

Jebel Ali port control employed approximately 23 multinational personnel, 10 of whom were VTSOs. The VTSOs operated a three-watch system with two officers on duty at all times. The VTSO's watch cycle comprised 2 days of duty between 1300 and 2100 followed by a day off, 2 days of duty between 2100 and 0600 followed by a day off, and 2 days of duty between 0600 and 1300 followed by 3 days off.

Three of the VTSOs held a V103 qualification[6]. Although DP World encouraged its VTSOs to obtain the V103, it was not its policy to pay for the training required. VTSO performance was monitored and assessed by senior managers who routinely listened to VHF channel 69 in their offices and prepared quarterly performance reports on the VTSOs that were linked to a bonus scheme.

The VTSO responsible for vessels entering and leaving the port during the evening of 11 February 2015 had worked in the port control since 2001. He was an Indian national and had held a radio operator's licence since 1996. The VTSO had previously worked in ports in Mumbai, India and Sharjah, UAE; he was not V-103 qualified and was not aware of the use of 'message markers'[7].

After joining DP World in Jebel Ali, the VTSO had completed 'on the job training', which had included practical experience with pilots and mooring teams, for between 4 and 6 months. He had also completed a 2 day training course in 2007 covering decision making and emergency response, and familiarisation training on the port's VTS radar and vessel database system that was installed in 2014. The VTSO had not participated in any port drills or exercises.

The VTSO was very experienced in the port's procedures and practices. He usually allowed 75 minutes for an outbound vessel to transit from its berth to No1 buoys. Similar to the other VTSOs, he routinely instructed inbound vessels to wait at between 1nm and 2nm from No 1 buoys (a practice supported by the harbourmaster and the deputy harbourmaster).

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[4] VTS is defined as a service implemented by a Competent Authority, designed to improve the safety and efficiency of vessel traffic and to protect the environment. See Paragraph 1.7.

[5] The World VTS Guide provides shipmasters and others with the information necessary to enter a VTS area. It is produced by IALA with input and advice from the International Harbour Masters' Association, the International Maritime Pilots' Association, the International Association of Ports and Harbours and the International Federation of Shipmasters' Associations.

[6] V-103 is the recognised international standard for training and certification for VTS personnel, developed by IALA.

[7] To ensure clarity and increase the probability of a message being understood, IALA has developed the following message markers: Instruction, Advice, Warning, Information, Question, Answer, Request and Intention.

The VTSO was aware that *Alexandra 1* did not usually transmit on AIS in the port area and therefore had to be tracked manually on the radar display[8]. The VTSO manually acquired *Alexandra 1*'s radar target as the vessel left the short-term anchorage prior to the collision, but he did not 'tag' the track with the vessel's name **(Figure 3)**.

1.6.4 Pilotage

Pilotage was compulsory for all vessels of 150t and over, with some approved exceptions. The pilot boarding area was centred 2nm south-east of the Jebel Ali Approach Light Buoy which was fitted with a racon[9].

Over 40 marine pilots were employed in Jebel Ali. The pilots were multinational and worked the same duty cycle as the VTSOs with between eight and ten pilots being on duty at all times.

Ever Smart's pilot was a Tunisian national and had obtained his STCW II/2 CoC in 2007. He started piloting in Tunisia in 2008 and moved to Jebel Ali in 2014. The pilot was authorised by DP World and completed between 60 and 70 ship movements per month.

The pilot was well rested when he boarded *Ever Smart*. He had not worked the previous day and had started his shift at 2100. *Ever Smart*'s departure was his first pilotage act of the day. The pilot was not under any pressure concerning when or where he transferred from the outbound container ship to the inbound *Alexandra 1*.

1.6.5 Operations manual

DP World's Operations Manual for Jebel Ali (revised in 2013) included, among other things, guidance and procedures on incident recording, maritime navigation and communication channels, mandatory reporting positions, right of way, channel entry and exit points, passing arrangements, speed limits, pilotage and pilot boarding arrangements.

The manual stated:

> *(With regard to right of way)*
>
> *In the event that the channel exit point of an outbound vessel is the same as the channel entry point of an inbound vessel "Right of Way" shall be with the outbound vessel.*
>
> *The pilots involved in a "Right of Way" situation shall take early and positive action and make their intentions clear.*
>
> *Pilot can relinquish his "Right of Way". VTSO shall provide necessary information to smoothly execute "Right of Way" situation.*

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[8] Vessels were usually tracked using AIS as manual acquisition and tracking was generally less reliable. Manual tracks were frequently lost and the information displayed on manual tracks was not as comprehensive or prominent as on AIS tracks.

[9] A racon is a radar transponder commonly used to mark maritime navigational hazards and other navigation features.

The vessel having "Right of Way" shall maintain her present speed and course but shall respect the International Regulations for the Prevention of Collision at Seas (1972) Rule 17. [sic]

(With regard to the circumstances in which a pilot is allowed to disembark from an outbound vessel in the channel)

The subject outbound vessel shall be allowed to navigate in the channel without a pilot on board only if all the following conditions are satisfied at the same time:

- *The vessel is in safe water i.e. has enough depth outside the channel or*
- *The vessel is already crossed the channel entry and exit location as mentioned in Tables 4.5 and 4.6**
- *Under restricted weather and visibility conditions, pilot shall disembark outside the channel*
- *The VTSO shall maintain uninterrupted communication with the assigned pilot to facilitate safe passage during the non-pilotage course.*
- *Exceptional and accepted vessels can go non-piloted without satisfying the above conditions* [sic]

* MAIB note – The tables referred to show permitted channel entry and exit points based on a vessel's draught. For example, a vessel with a draught of between 8m and 10m is allowed to enter or leave the channel to the east or the west between No3 and No4 buoys. Vessels with a draught of over 10m must enter and exit the channel between the No1 buoys.

(With regard to the movement of inbound vessels)

If the vessel is not equipped with AIS, the VTSO shall track the inbound vessel on the radar (radar target) and tag it her name so that the target can be easily tracked on the computerized display during the course of future communication. [sic]

(With regard to manoeuvring from the short-term anchorage)

VTSO should advise the subject vessel to proceed to the designated pilot boarding area or other appropriate location depending on the draught of the vessel.

The operations manual also prohibited vessels with a combined length of over 500m and tankers over 200m from passing in the channel.

1.6.6 VHF Communication

Recordings of the VHF communications during the evening of 11 February showed that channel 69 was very busy with exchanges frequently being interrupted and over-spoken.

1.6.7 Previous accident

On 10 February 2009, the inbound Malta registered tanker *Kashmir* and the outbound Singapore registered container vessel *Sima Saman* collided in the vicinity of the No6 buoys in the Jebel Ali approach channel. It was daylight but the visibility was occasionally reduced to about 200m in fog. Both vessels had pilots on board.

A port to port passing had been agreed but *Kashmir* was turned across the channel in order to avoid the green (western) No6 buoy. Once the vessel was clear of the buoy, starboard helm was used to manoeuvre the vessel back towards the western side of the channel. However, collision with *Sima Saman*, which was in the centre of the channel, could not be avoided. *Sima Saman*'s bow penetrated *Kashmir*'s hull in the vicinity of the tanker's port manifold. The subsequent fire and explosion **(Figure 14)** caused severe damage to both vessels. Two of the tanker's crew were injured. There was no pollution.

Following the accident, among other things, DP World UAE introduced measures to restrict the passing of certain types and sizes of vessel in the channel (see paragraph 1.6.5).

Figure 14: *Kashmir* on fire in the Jebel Ali approach channel

1.7 VESSEL TRAFFIC SERVICES

A VTS is a service, implemented by a competent authority, that is designed to improve the safety and efficiency of vessel traffic and to protect the environment. To do this, it should be able to interact with the traffic and respond to developing traffic situations. Three levels of service can be provided: an information service (INS), a navigational assistance service (NAS) and a traffic organisation service (TOS).

Annex 1 of the International Maritime Organization (IMO) Resolution A.857(20) states:

> *2.3.1 The information service is provided by broadcasting information at fixed times and intervals or when deemed necessary by the VTS or at the request of a vessel, and may include for example reports on the position, identity and intentions of other traffic; waterway conditions; weather; hazards; or any other factors that may influence the vessel's transit.*
>
> *2.3.2 The navigational assistance service is especially important in difficult navigational or meteorological circumstance or in case of defects or deficiencies. This service is normally rendered at the request of a vessel or by the VTS when deemed necessary.*
>
> *2.3.3 The traffic organisation service concerns the operational management of traffic and the forward planning of vessel movements to prevent congestion and dangerous situations, and is particularly relevant in times of high traffic density or when the movement of special transports may effect the flow of other traffic. The service may also include establishing and operating a system of traffic clearances or VTS sailing plans or both in relation to priority of movements, allocation of space, mandatory reporting of movements in the VTS area, routes to be followed, speed limits to be observed or other appropriate measures which are considered necessary by the VTS authority.*
>
> *2.3.4 When the VTS is authorized to issue instructions to vessels, these instructions should be result-oriented only, leaving the details of execution, such as course to be steered or engine manoeuvres to be executed, to the master or pilot on board the vessel. Care should be taken that VTS operations do not encroach upon the master's responsibility for safe navigation, or disturb the traditional relationship between master and pilot.* [sic]

With reference to the provision, declaration of services, the IALA VTS Manual includes:

> *An Information Service (INS) is the basic type of service. It should be declared formally and provided as a service by all VTS. When a VTS authority organises and manages traffic within its VTS area as part of its function, then it would normally also declare the provision of a Traffic Organisation Service (TOS).*

1.8 AUTOMATIC IDENTIFICATION SYSTEM

1.8.1 Carriage

The International Convention for the Safety of Life at Sea 1974, as amended (SOLAS), requires all cargo ships of 300gt and over that are engaged on international voyages to be fitted with AIS. Ships fitted with AIS are required to maintain AIS in operation at all times except where international agreements, rules or standards provide for the protection of navigational information.

1.8.2 Guidance

The IMO Resolution A.917 (22), which provides guidance on the use of AIS, includes:

INHERENT LIMITATIONS OF AIS

31. The officer of the watch should always be aware that other ships, in particular leisure craft, fishing boats and warships, and some coastal shore stations including Vessel Traffic Service centres, might not be fitted with AIS.

32. The OOW should always be aware that other ships fitted with AIS as a mandatory carriage requirement might switch off AIS under certain circumstances by professional judgement of the master.

USE OF AIS IN COLLISION AVOIDANCE SITUATIONS

39. The potential of AIS as an anti collision device is recognised and AIS may be recommended as such a device in due time.

40. Nevertheless, AIS information may be used to assist collision avoidance decision making. When using the AIS in the ship to ship mode for anti collision purposes, the following precautionary points should be borne in mind: a. AIS is an additional source of navigational information. It does not replace, but supports, navigational systems such as radar target tracking and VTS; and b. The use of AIS does not negate the responsibility of the OOW to comply at all times with the Collision Regulations

41. The user should not rely on AIS as the sole information system, but should make use of all safety relevant information available

43. Once a ship has been detected, AIS can assist tracking it as a target. By monitoring the information broadcast by that target, its actions can also be monitored. Changes in heading and course are, for example, immediately apparent, and many of the problems common to tracking targets by radar, namely clutter, target swap as ships pass close by and target loss following a fast manoeuvre, do not affect AIS. AIS can also assist in the identification of targets, by name or call sign and by ship type and navigational status. [*sic*]

The IMO guidelines for the use of AIS have been included in Marine Guidance Note 324 (M+F) – Radio: Operational Guidance on the Use of VHF Radio and Automatic Identification Systems (AIS at Sea), which was published in 2006.

SECTION 2 – ANALYSIS

2.1 AIM

The purpose of the analysis is to determine the contributory causes and circumstances of the accident as a basis for making recommendations to prevent similar accidents occurring in the future.

2.2 THE COLLISION

The collision between *Ever Smart* and *Alexandra 1* stemmed from the vessels' masters having differing perceptions of how the vessels would pass each other. The tanker's master assumed that the container ship would alter to port on leaving the buoyed channel and pass astern. Consequently, as *Ever Smart* neared the No1 buoys, he thought it safe to manoeuvre *Alexandra 1* slowly ahead across the channel entrance. The container ship's master, however, assumed that the tanker was stationary and would pass down his port side. Therefore, after the pilot had disembarked, he remained on the same heading and increased speed. The actions of both masters put their vessels on a steady bearing **(Figure 8)**.

Within 1 minute of *Ever Smart* leaving the channel, *Alexandra 1*'s master noticed that the container ship had not altered course as he had expected. He then acted immediately to try and prevent a collision. However, *Ever Smart*'s master was not monitoring *Alexandra 1*. Therefore, he was not aware of its proximity until alerted by VHF calls seconds before the collision. By then, it was too late for him to take any effective avoiding action. Unfortunately, the setting of 'full astern' on board *Alexandra 1* was also too late to prevent the collision **(Figures 10** and **11)**.

The reliance of *Alexandra 1*'s master on scanty VHF information and the failure of *Ever Smart*'s master to keep a proper lookout and monitor *Alexandra 1*'s movement were pivotal to this accident. However, it is also evident that a lack of an agreed plan and effective communication, co-ordination and monitoring were significant factors, which contributed to the flaws in *Ever Smart*'s and *Alexandra 1*'s masters' situational awareness. On this occasion, the precautions of pilotage and VTS in Jebel Ali, which should have been able to manage and de-conflict the vessels' movements, were ineffective.

2.3 VESSEL PERSPECTIVES

2.3.1 *Alexandra 1*

The VTSO instructed *Alexandra 1* to be at No1 buoys at 2315 **(Table 1)**. The VTSO also authorised the master to enter the channel as soon as the container ship was clear **(Table 3)**. It is evident from *Alexandra 1*'s master's handover notes (paragraph 1.5.2) that he was used to having to remain at least 1.5nm from the No1 buoys when waiting for a pilot in Jebel Ali. Consequently, although on this occasion the VTSO did not instruct *Alexandra 1* to wait a specific distance from the buoys, the master's decision to stop the vessel's engine 1.3nm from the channel at 2314 indicates that he was following usual practice.

However, at this point, *Ever Smart* had only just passed No8 buoys and, over the following 25 minutes, while *Alexandra 1* waited for the container ship to clear the channel, the tanker closed the channel entrance due to a combination of 'dead slow ahead' engine movements and drift. No attempt was made to check *Alexandra 1*'s movement to the east.

By itself, *Alexandra 1*'s proximity to the channel entrance was not hazardous providing the masters of both vessels were aware of the other's intentions. As soon as the tanker's master mistook the VTSO's instruction to '*pass astern of the tanker*' as an instruction to *Ever Smart* rather than *Zakheer Bravo*, his perception of how the vessels would pass differed dramatically from that of *Ever Smart*'s master.

Until 2329, *Alexandra 1* had remained to the north-west of the channel and had not crossed the line of the channel's entrance **(Figures 3, 4** and **6)**. However, after *Alexandra 1*'s master assessed that *Ever Smart* would need to alter course to port on leaving the channel in order to pass astern, he manoeuvred the tanker slowly ahead. This was probably done to give *Ever Smart* more sea room and to enable the approaching pilot boat to come alongside. The tanker's master was not aware that the container ship's master did not intend to alter course. He also did not appreciate the danger of straddling the slow moving and relatively un-manoeuvrable *Alexandra 1* across the line of the buoyed channel just 4 cables from its entrance.

2.3.2 *Ever Smart*

When the pilot informed *Ever Smart*'s master that he would be disembarking, the master's question '*do you think I can go myself?*' **(Table 5)** indicated that he was a little surprised that the pilot was not staying on board until the containership had left the channel. Nonetheless, he did not challenge the pilot's departure.

At the time, *Ever Smart* was following the channel as intended, and it was only 1.3nm from the channel end. *Alexandra 1* was 2.9nm off the container ship's port bow and the tanker was not impeding *Ever Smart*'s passage to seaward. Moreover, the pilot had informed the master that the tanker would wait for *Ever Smart* to clear the channel. Therefore, it was reasonable for the master to assume that the tanker would pass down the container ship's port side. At no time did the master or pilot discuss the option of altering course to leave *Alexandra 1* on the container vessel's starboard side.

2.4 VHF COMMUNICATIONS WATCH

In busy port areas, the clarity and accuracy of VHF traffic is essential. However, the lack of discipline on VHF radio is a common problem in some regions. Constant 'chatter' resulting in exchanges being over-spoken is a regular occurrence. Consequently, the possibility of missing transmissions or parts of transmissions is increased.

In this case, the port's working channel, VHF channel 69, was very busy and *Alexandra 1*'s master did not hear the full exchange between port control and the tug *Zakheer Bravo*. As a result, although the master correctly assumed that the 'tanker' referred to in the exchange was *Alexandra 1*, he clearly did not know the name of the vessel the VTSO was talking to. In such circumstances, it would have been appropriate for the master to clarify the situation with either port control or *Ever Smart* rather than taking action on the basis of incomplete information.

2.5 LOOKOUT AND MONITORING

In the 8 minutes before the collision, it is apparent that *Ever Smart*'s bridge team did not monitor *Alexandra 1*'s position and movement. Indeed, the third officer's response to Jebel Ali port control's VHF call at 2341:48 **(Table 5)**, when standing at the front of the bridge **(Figure 5)**, and the master's exclamation of '*what's that?*' just 3 seconds before the collision, indicates that both officers were unaware of the tanker's proximity. They had lost situational awareness.

During and immediately after the pilot's disembarkation, *Ever Smart*'s master was aware of the container ship's position towards the western side of the channel and he was focused on clearing the channel and commencing the sea passage as soon as possible. This is supported by his change of the radar display to 'north up', his order to the helmsman to steer 319° and the increase in speed.

Ever Smart's master does not appear to have paid similar attention to the predicted close passing distance between *Ever Smart* and *Alexandra 1*. He had known that *Alexandra 1* was waiting at the end of the buoyed channel and he had been reminded of the tanker's presence by the pilot **(Table 4)**. However, the master did not select *Alexandra 1* as an ARPA target. Consequently, he was unaware of its movement towards the channel entrance and the reducing CPA. Instead, he relied on his assessment by eye that it would pass 1.5 cables down the container ship's port side.

Ever Smart's master assumed that *Alexandra 1* would keep clear and he didn't take it upon himself or task the third officer to closely monitor the tanker. As *Ever Smart* left the buoyed channel, *Alexandra 1* was only 4 cables fine off the container ship's port bow **(Figure 8)**. Nonetheless, the tanker was still beyond its 'shadow zone' ahead and the tanker's starboard side and masthead navigation lights and its dangerous cargo light would still have been visible. Despite this, the container ship's master and third officer either did not see the tanker or they did not recognise or appreciate the imminent risk of collision.

In the 2 minutes before the collision, other than the third officer informing the engine room of 'full away' and filling in the deck log, there was little activity on the bridge. It is not known what the master was doing, but it is evident that he was not looking out of the window or closely monitoring the radar **(Figure 9)**. Given *Ever Smart*'s relative manoeuvrability (paragraph 1.4.4), the container ship could have turned to either port or to starboard on leaving the channel in time to avoid *Alexandra 1* had the tanker been monitored and the risk of collision appreciated.

2.6 ACTION TO AVOID THE COLLISION

2.6.1 The use of VHF radio

By the time *Alexandra 1*'s master realised that *Ever Smart* was not altering course after passing between the No1 buoys, the distance between the vessels was less than 2 cables. As the container ship was closing the already moving tanker at a speed of 12.4 kts, there was less than 1 minute available for avoiding action to be taken. In the circumstances, *Alexandra 1*'s master's decision to call Jebel Ali port control rather than calling *Ever Smart* directly, although well intended, potentially cost valuable seconds.

Alexandra 1's master's use of 'container' in the VHF exchange **(Table 6)** possibly indicates that he was unable to call *Ever Smart* because he had either not noted its name during the VHF exchange 45 minutes earlier **(Table 3)** or that he had forgotten it in the heat of the moment. However, it is also possible, taking into account his view of the port control (paragraph 1.5.3), together with likely language difficulties, that he considered the VTSO had more authority and was better placed to resolve the situation quickly and effectively.

2.6.2 The use of sound signals

Rule 34(d) of the International Regulations for the Prevention of Collisions at Sea 1972, as amended (COLREGS) requires that:

> *When vessels in sight of one another are approaching each other and from any cause either vessel fails to understand the intentions or actions of the other, or is in doubt whether sufficient action is being taken by the other to avoid collision, the vessel in doubt shall immediately indicate such doubt by giving at least five short and rapid blasts on the whistle. Such signal may be supplemented by a light signal of at least five short and rapid flashed.*

In this case, although *Alexandra 1*'s master clearly had doubts regarding the actions of *Ever Smart*, no sound signals were made. However, given the poor situational awareness of *Ever Smart*'s master and its third officer, and their slow reaction to the warnings passed by VHF radio **(Table 6)**, it is impossible to determine whether the sounding of five short blasts by *Alexandra 1* would have prompted them into taking avoiding action any sooner.

2.7 THE ROLE OF THE VTSO

2.7.1 The plan

At 2200, when the VTSO instructed *Alexandra 1* to be at the No1 buoys at 2315, he was expecting *Ever Smart* to be sailing soon afterwards. In accordance with usual practice, the VTSO had allowed 75 minutes for the container ship to transit from its berth to the channel entrance. The VTSO's intention for *Alexandra 1* to wait outside the channel until *Ever Smart* was clear accorded with the port's procedures regarding the passing of larger vessels in the channel and right of way (see paragraph 1.6.5).

However, the VTSO did not follow the usual practice of specifying the distance at which the tanker should remain from the No1 buoys. Indeed, contrary to normal practice, at 2248 he instructed *Alexandra 1*'s master to "proceed to buoy No1" and to "keep watch all of the time" (see Page 4). Also, after *Ever Smart* sailed at 2230, he did not update *Alexandra 1* of the revised time the container ship would clear the channel. Consequently, *Alexandra 1* arrived off the entrance to the buoyed channel much earlier than necessary.

2.7.2 Monitoring

The VTSO had arranged for *Ever Smart*'s pilot to transfer to *Alexandra 1* **(Table 2)** and he advised *Alexandra 1* of the plan **(Table 3)**. Thereafter, the VTSO confirmed the pilot embarkation with *Alexandra 1*'s master at 2319 and showed that he was aware of the tanker's position 10 minutes later when talking to *Zakheer Bravo*

(despite not tagging the tanker's radar target with a name **(Figure 3)**). Therefore, the VTSO had been communicating with the pilot and both vessels and he was broadly aware of the vessels' movements. However, although *Alexandra 1* had closed to within 1nm of the channel entrance, the VTSO did not challenge the tanker about its position.

In addition, the VTSO's response to the VHF call from *Alexandra 1* at 2341 **(Table 5)**, and his subsequent call to *Ever Smart* **(Table 6)**, indicate that he had not realised the seriousness of the situation that had developed. It is likely, the very slow movement of *Alexandra 1*, the problems associated with manual tracking and *Alexandra 1*'s distance from the No1 buoys, would have made it extremely difficult for the VTSO to identify that the vessels were on collision courses. It is also likely that the VTSO had not closely monitored the developing situation because he had been advised by the pilot that *Ever Smart* would remain in the channel with No1 buoys and he had received confirmation from *Alexandra 1*'s master that the tanker would not enter the channel until the container ship was clear (Tables 2 and 3). Furthermore, as the pilot had been on board *Ever Smart* and was transferring to *Alexandra 1*, the VTSO probably assumed that the vessels were manoeuvring in accordance with the pilot's advice.

2.7.3 Response

The VTSO's VHF exchanges with *Alexandra 1* and *Ever Smart* immediately before the collision indicate that he did not know how to communicate effectively in an emergency. The lack of urgency and clarity of the exchanges possibly reflected the VTSO's lack of appreciation of the situation. However, it also possibly reflected his lack of formal training in VTS and a lack of experience of emergency drills.

The interval between the VTSO's call to *Ever Smart* and the collision was only 31 seconds. Therefore, it is impossible to determine whether the use of a message marker such as 'Warning' would have prompted quicker action by *Ever Smart*'s bridge team. However, the circumstances of this accident underline the importance and benefits of V103 training elements such as the use of message markers, which potentially could prevent accidents in the future.

2.8 THE ROLE OF THE PILOT

2.8.1 Assessment

The pilot had monitored *Alexandra 1* on the port radar display **(Figure 4)**, but it seems likely that he did not appreciate the tanker's movement, how close the tanker was to the channel entrance, or how close the vessels would pass. By 2334, when the pilot was preparing to leave *Ever Smart*'s bridge, *Alexandra 1* had closed to within 0.7nm of the No1 buoys and was starting to encroach on the channel entrance **(Figure 6)**. Even assuming that *Alexandra 1* had remained stationary, the passing distance between the vessels would have been less than the 1.5 cables estimated by the container ship's master. This was unnecessarily close, but the risk of collision was not foreseen by the pilot.

2.8.2 Co-ordination and communication

The pilot's failure to co-ordinate and communicate the passing arrangements for *Ever Smart* and *Alexandra 1* were significant omissions. Although both masters were aware of the other vessel, the plan for the passing of the container ship and the tanker was always ambiguous. The pilot had given *Ever Smart*'s master clear instructions of what to do following his disembarkation and he and the container ship's master showed a common understanding of the situation. However, *Alexandra 1*'s master was not told where to wait or the intended movement of *Ever Smart* on leaving the channel.

As the outbound vessel, *Ever Smart* had 'right of way' over the inbound *Alexandra 1*. In such circumstances, the port's operational procedures (see paragraph 1.6.5) required pilots to '*take early and positive action and make their intentions clear*'. In this case, the pilot did not do so.

Before leaving *Ever Smart*, it would have been appropriate for the pilot to have at least informed *Alexandra 1*'s master that *Ever Smart* would be maintaining its heading on leaving the channel. This would have clarified the situation and reduced the possibility of *Alexandra 1*'s master misinterpreting the exchange between Jebel Ali port control and *Zakheer Bravo* on the busy VHF radio. Informing the port control of the intention to transfer between vessels and the intended passing arrangement would also have contributed to the VTSO's situational awareness.

2.8.3 Disembarkation

The pilot's disembarkation from *Ever Smart* on passing between the No2 buoys, and the container ship's continued passage to the No1 buoys, were in accordance with the port's procedures. With a 12m draught, *Ever Smart* was required to stay in the channel, but the pilot was allowed to disembark as the depth of water outside the channel was sufficient for the container ship to navigate safely if required. In addition, the passing situation with *Alexandra 1* appeared to be straightforward.

However, although the pilot followed the port's procedures, in hindsight the pilot's transfer from *Ever Smart* to *Alexandra 1* was premature. He was not constrained by time or other pressures. Therefore, there was no apparent reason why the pilot could not have stayed on *Ever Smart* until the container ship cleared the channel. If he had done so, he would have been in a better position to co-ordinate and monitor the actions of both vessels until the risk of collision had passed.

2.9 VESSEL TRAFFIC SERVICES

Jebel Ali is a very busy port that deals with a significant number of vessel movements each year. As deep draught vessels of differing types can only enter and leave the port via the main buoyed channel, it is imperative that the vessel traffic is organised in order to maintain flow and reduce the risk of collisions. To this end, DP World UAE had developed the port control to provide services aligned to the INS and TOS as defined in IMO Resolution A.857(20) (paragraph 1.7) and the VTS Manual. However, Jebel Ali's traffic services did not meet the VTS standards set by the IALA, mainly due to the lack of IALA V103 qualifications held by its VTSOs.

Jebel Ali port control had sufficient personnel to provide a 24 hour service and it was equipped to monitor and communicate with vessels in the port area. The port's operational procedures were also comprehensive and had been revised to reflect the lessons learned from the collision between *Kashmir* and *Sima Saman* in 2009 (paragraph 1.6.7). Nonetheless, although the VTSOs completed on the job training and were to be closely supervised, very few held a V103 qualification. In addition, the VTSOs did not participate in emergency drills. As a result, the VTSOs might not have been adequately equipped to recognise when potentially hazardous situations were developing and how to respond accordingly.

2.10 THE USE OF AIS

Alexandra 1's AIS was not operating. Therefore, information such as the vessel's name was not readily available to *Ever Smart*'s bridge team or the VTSO. Similarly, AIS information transmitted from *Ever Smart* and other vessels such as *Zakheer Bravo* was not available on board *Alexandra 1*. The lack of AIS information possibly contributed to the tanker master's ignorance of the container ship's identity immediately before the collision. It also possibly contributed to the container ship master's ignorance of the tanker's identity immediately after. However, the names of the vessels had been mentioned on the VHF radio on numerous occasions before the collision. Therefore, AIS was not the only source of such information.

AIS must be used with caution and the reliance placed on the system for collision avoidance by *Ever Smart*'s bridge watchkeepers, which is becoming increasingly widespread, is of concern. AIS has certain advantages over ARPA (paragraph 1.8.2) and, except for security reasons or specific exemptions, the system should always be operated on board ships on which it is required to be carried.

In this case, there appears to be no reason why *Alexandra 1*, which was entering a large commercial port, had its AIS turned off. Therefore, it is surprising that Jebel Ali port control had not challenged *Alexandra 1* over its lack of AIS transmissions during this and the vessel's previous visits, particularly as AIS was its preferred and most reliable method of tracking vessels using the port.

SECTION 3 – CONCLUSIONS

3.1 SAFETY ISSUES DIRECTLY CONTRIBUTING TO THE ACCIDENT THAT HAVE BEEN ADDRESSED OR RESULTED IN RECOMMENDATIONS

1. The reliance of *Alexandra 1*'s master on scanty VHF information and the failure of *Ever Smart*'s master to keep a proper lookout and monitor *Alexandra 1*'s movement were pivotal to this accident. [2.2, 2.4, 2.5]

2. The precautions of pilotage and VTS in Jebel Ali, which should have been able to manage and de-conflict the vessels' movements, were ineffective. [2.2]

3. The VTSO's instructions to *Alexandra 1* resulted in the tanker arriving off the buoyed channel 25 minutes earlier than was necessary. While the tanker waited for *Ever Smart* to clear the channel, no action was taken to stop the tanker from slowly moving towards the channel's entrance. [2.3.1, 2.7.1]

4. The movement of *Alexandra 1* into *Ever Smart*'s path resulted from its master's assumption that *Ever Smart* would turn to port on leaving the channel. [2.3.1]

5. *Alexandra 1*'s master did not appreciate the danger of straddling the slow-moving, relatively un-manoeuvrable tanker across the line of the buoyed channel just 4 cables from its entrance. [2.3.1]

6. During the 8 minutes from the pilot's disembarkation until the collision, *Ever Smart*'s bridge team did not monitor *Alexandra 1*'s position and movement. Both the master and the third officer lost situational awareness. [2.5]

7. The decision of *Alexandra 1*'s master to call Jebel Ali port control, rather than calling *Ever Smart* when he realised the container ship had not altered course, cost valuable seconds. [2.6]

8. The VTSO did not challenge *Alexandra 1*'s proximity to the channel entrance or appreciate the seriousness of the situation when he was alerted by *Alexandra 1*'s master. [2.7.2]

9. The VTSO's VHF exchanges with *Alexandra 1* and *Ever Smart* immediately before the collision indicate that he did not know how to communicate effectively in an emergency. [2.7.3]

10. The pilot monitored *Alexandra 1* but it is apparent that he had not appreciated how close the tanker was to the channel entrance or its potential closest point of approach with *Ever Smart*. [2.8.1]

11. The pilot's failure to co-ordinate and communicate the passing arrangements for *Ever Smart* and *Alexandra 1* was significant. [2.8.2]

12. The pilot's disembarkation from *Ever Smart* was premature. [2.8.3]

3.2 SAFETY ISSUES NOT DIRECTLY CONTRIBUTING TO THE ACCIDENT THAT HAVE BEEN ADDRESSED OR RESULTED IN RECOMMENDATIONS

1. Most of the port's VTSOs had not completed the IALA V103 qualification or participated in emergency drills. Therefore they might not have been adequately equipped to recognise when potentially hazardous situations were developing and how to respond accordingly. [2.9]

2. The AIS on board *Alexandra 1* was not operating. This was contrary to the requirements of SOLAS and meant that information such as vessel names was not readily available on board *Alexandra 1* and *Ever Smart*, or to the VTSO. [2.10]

3.3 OTHER SAFETY ISSUES NOT DIRECTLY CONTRIBUTING TO THE ACCIDENT[10]

1. *Alexandra 1*'s master had doubts regarding the actions of *Ever Smart,* but no sound signals were made. [2.6]

[10] These safety issues identify lessons to be learned. They do not merit a safety recommendation based on this investigation alone. However, they may be used for analysing trends in marine accidents or in support of a future safety recommendation

SECTION 4 – ACTION TAKEN

4.1 ACTIONS TAKEN BY OTHER ORGANISATIONS

4.1.1 The Republic of the Marshall Islands has:

On 10 March 2015, issued Marine Safety Advisory No 10 – 15 '*Lessons Learned: Safe Navigation in the Vicinity of Designated Pilot Embarkation/Disembarkation Areas'* **(Annex A)**.

4.1.2 Evergreen Marine (UK) Limited has:

Issued a circular to its fleet drawing attention to the circumstances of this accident and highlighting the importance of maintaining situational awareness. It has also taken steps to improve safety management on board its vessels, including:

- The establishment of an e-mail reporting system and safety questionnaire for crew members to report safety issues.
- The use of masters and chief engineers to sea-ride vessels in order to:
  - act as mentors
  - assess the implementation of bridge and engine room resource management
  - provide assistance with safety management issues.
- The introduction of biennial proficiency checks.
- The introduction of quarterly reviews of risk assessments based on port state control inspection reports, external and internal audits and crew feedback.
- The enhancement of bridge and engine room management training to include an assessment of trainees' attitude and competency.

4.1.3 Ishps Management Private Limited has:

- Stated that *Alexandra 1*'s master and navigating officers will be refreshed in bridge resource management and bridge team management procedures and techniques before returning to sea. The officers' knowledge of navigational procedures and the company's safety management system will also be re-assessed.
- Introduced a requirement for all navigating officers joining its vessels to attend bridge resource and bridge team management refresher training if they have not completed this training within the last 5 years.
- Introduced a requirement for all masters to have completed a 'ship handling course' and to complete refresher training in 'ship handling techniques' where the 'ship handling course' was not completed in the last 5 years.
- Placed *Alexandra 1* on its 'enhanced focused' list to ensure that the vessel's operations are closely monitored.

SECTION 5 – RECOMMENDATIONS

DP World UAE Region is recommended to:

2015/164 Take action to improve the effectiveness of its vessel traffic and pilotage services, taking into account the circumstances of this accident, with particular emphasis placed on:

- Ensuring the effective promulgation of passing arrangements
- Improving pilot and VTSO liaison
- Establishing more robust criteria and procedures for pilot disembarkation
- Careful evaluation of the benefits of providing VTS operators with VTS training
- Establishing a regime of regular emergency drills to test the port's ability to respond to developing situations and enhance the experience and training provided to key personnel
- Specifying clear requirements on the use of AIS for vessels operating within the port limits and approaches to Jebel Ali.

Safety recommendations shall in no case create a presumption of blame or liability

Annex A

Republic of the Marshall Islands Marine Safety Advisory 10-15 '*Lessons Learned: Safe Navigation in the Vicinity of Designated Pilot Embarkation/Disembarkation Areas*'

Republic of the Marshall Islands

MARITIME ADMINISTRATOR

11495 COMMERCE PARK DRIVE, RESTON, VIRGINIA 20191-1506
TELEPHONE: +1-703-620-4880 FAX: +1-703-476-8522
EMAIL: maritime@register-iri.com WEBSITE: www.register-iri.com

MARINE SAFETY ADVISORY NO. 10-15

To: **Regional Marine Safety Offices, Nautical Inspectors, Masters, Owners/Agents**

Subject: **LESSONS LEARNED: SAFE NAVIGATION IN THE VICINITY OF DESIGNATED PILOT EMBARKATION / DISEMBARKATION AREAS**

Date: **10 March 2015**

In recent months the Republic of the Marshall Islands (RMI) Maritime Administrator (the "Administrator") has received several reports of collisions, allisions and groundings involving RMI registered ships that have occurred either in or near designated pilot embarkation / disembarkation areas. The underlying cause of these marine casualties was that the ship's Master and members of the bridge team became distracted and lost their situational awareness either while maneuvering the ship to rendezvous with the pilot vessel while preparing to embark or disembark a pilot.

The following contributing causal factors were also noted during the Administrator's investigations:

- The bridge team's over-reliance on the pilot stations' radioed advisories and wrongly assuming that they were consistent with the safe navigation. Examples of the consequences of such over-reliance include: a ship drifting across a busy shipping channel and colliding with an outbound ship; a ship alliding with a breakwater; or, a ship going aground on a nearby shoal.
- Lack of effective voyage planning and preparation by the bridge team to embark or disembark a pilot. For example, it has been observed that "no go" areas in the vicinity of the designated pilot embarkation / disembarkation area were not identified and plotted on the chart during voyage planning or, if they were plotted, they were not reviewed by the bridge team prior to maneuvering the ship to embark or disembark a pilot.
- Ineffective bridge team management. It has been noted that Masters appear reluctant to clearly delegate and identify the Officer of the Watch's (OOW) role and responsibilities regarding monitoring the ship's position and other vessel traffic or to handle the ship in order to avoid "no go" areas or other vessel traffic. Rather than working with the OOW as a team, Masters are assuming multi-tasking responsibility and personally endeavoring to supervise each step associated with the pilot's embarkation / disembarkation while also

endeavoring to personally maneuver the ship. For instance, it has also been observed that Masters may task the OOW rather than another officer or senior rating to escort the pilot to and from the bridge.

- Ship management's Safety Management System's navigation procedures have not adequately identified and mitigated the associated navigation risks with embarking / disembarking the pilot. For example these risks include: vessel traffic entering and leaving port; the bridge team needing to transition from either the routine of a sea passage or from navigation while under pilotage; managing communications from Vessel Traffic Service centers; potential distractions associated with making final arrangements for entering port including communications with the ship's agent or sending departure messages, etc.

Ship managers are encouraged to review their Safety Management System's navigation procedures as well as the content of their shipboard bridge team training modules and, if deemed appropriate, revise them taking into account these lessons learned. In addition, Masters are encouraged to review this Marine Safety Advisory with their ship's bridge team.

Marine Accident Report

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