



**The Bahamas
Maritime Authority**

THE COMMONWEALTH OF THE BAHAMAS

M.V. CMA CGM BERLIOZ

IMO NUMBER: 9222297

OFFICIAL NUMBER: 7000927



**Report of the marine safety investigation into the
disappearance of a person in the Red Sea on the
21st March 2017**

The Bahamas conducts marine safety or other investigations on ships flying the flag of the Commonwealth of the Bahamas in accordance with the obligations set forth in International Conventions to which The Bahamas is a Party. In accordance with the IMO Casualty Investigation Code, mandated by the International Convention for the Safety of Life at Sea (SOLAS) Regulation XI-1/6, investigations have the objective of preventing marine casualties and marine incidents in the future and do not seek to apportion blame or determine liability.

It should be noted that the Bahamas Merchant Shipping Act, Para 170 (2) requires officers of a ship involved in an accident to answer an Inspector's questions fully and truly. If the contents of a report were subsequently submitted as evidence in court proceedings relating to an accident this could offend the principle that individuals cannot be required to give evidence against themselves. The Bahamas Maritime Authority makes this report available to any interested individuals, organizations, agencies or States on the strict understanding that it will not be used as evidence in any legal proceedings anywhere in the world.

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1 GLOSSARY OF ABBREVIATIONS AND ACRONYMS

BA	British Admiralty
CO₂	Carbon Dioxide Gas
GSL	Global Ship Lease 23 Ltd
IMO	International Maritime Organisation
ISPS	International Ship and Port Facility Security Code
JRCC	Joint Rescue Coordination Centre
MoB	Man Overboard
MRCC	Maritime Rescue Coordination Centre
NW	North Westerly
OOW	Officer of the Watch
PPE	Personal Protective Equipment
SMS	Safety Management System
STCW	International Convention on Standards of Training, Certification and Watchkeeping 1978, as amended
UAE	United Arab Emirates

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SUMMARY

- 2.1 On 21st March 2017, the Bahamas registered container vessel ‘CMA CGM Berlioz’ was on passage from the southern end of the Suez Canal towards Jeddah, Saudi Arabia. At 12:40¹ hours the foreman of the on-board riding team alerted the Chief Officer to the fact that one of the riding team had not been sighted since 10:40 that morning. Despite a brief search of localised areas of the vessel by his colleagues, he had not been located.
- 2.2 The vessel conducted a full search of the vessel and returned to the geographical position corresponding to the time at which the person had last been sighted on the vessel. A systematic expanding square search was undertaken by the vessel. This was later supplemented by assistance from Egyptian Naval vessels and an aircraft.
- 2.3 The search carried on throughout the rest of the day and into the late evening. After sunset, the likelihood of sighting a person in the water became improbable and the vessel called off its search and resumed its voyage to Jeddah.
- 2.4 The incident was reported to the relevant authorities as a man overboard (MoB) incident.
- 2.5 The marine safety investigation recognised that during the course of the investigation several aspects of the vessel’s Safety Management System had latent procedural shortcomings in relation to 3rd party contractors. It was determined that although these were not directly related to the events that took place resulting in the missing 3rd party contractor, identifying these within the report would benefit the operators in addressing these shortcomings.

¹ Unless otherwise stated, all times quoted are local time

3 DETAILS OF INVOLVED VESSEL AND OTHER MATTERS

3.1 Vessel Details and Crew Particulars

3.1.1 ‘CMA CGM Berlioz’ is an all welded, steel constructed container vessel built in Korea in 2001. The vessel is owned by Global Ship Lease 23 Ltd. and operated by CMA CGM of France.

The principle details as at 21st March 2017 were as follows:

IMO No.:	9222297
Official No.:	7000927
Call Sign:	C6CP5
Builders:	Hyundai Heavy Industries, Ulsan
Class Society:	Bureau Veritas
Gross Tonnage:	73,157
Net Tonnage:	41,255
Length Overall:	298.51 metres
Freeboard:	6.15 metres
Breadth:	40.30 metres
Summer Draft:	14.27 metres
Summer Deadweight:	80,250 metric tonnes
Shaft Power:	68,520 kW
Service Speed:	25.9 knots
Complement:	27 persons including a 4-man riding team

3.1.2 The vessel was first registered under the Bahamas Flag on 1st March 2016. Bureau Veritas was the Classification Society. At the time of the incident the vessel complied with all statutory and international requirements and certification.

3.1.3 The vessel had one Condition of Class relating to the main boiler which was not contributory to the incident being investigated.

- 3.1.4 At the time of the incident under investigation, the vessel had a complement of 27 persons on board. These comprised of the following nationalities:

Ukrainian	9
Moldovan	1
Filipino	13
Indian	4

The level of manning on the vessel complied with and exceeded the Safe Manning Document (SMD) issued by the Commonwealth of the Bahamas.

- 3.1.5 The Master, a Ukrainian national held an Unlimited Master Mariner Certificate at the management level (II/2)² issued by the Ukrainian Maritime Authority as required by the International Convention on Standards of Training, Certification and Watchkeeping 1978, as amended (STCW).

It was duly recognised as being in accordance with the provisions of Regulation I/10 of the STCW Convention and endorsed by the Commonwealth of the Bahamas on 14th July 2016.

- 3.1.6 The Chief Officer, a Ukrainian national held an Unlimited Master Mariner Certificate issued by the Ukrainian Maritime Authority. It was duly recognised as being in accordance with the provisions of Regulation I/10 of the STCW Convention and endorsed by the Commonwealth of the Bahamas on 11th March 2016.

- 3.1.7 The 2nd Navigating officer, a Ukrainian national held a Chief Mate Certificate issued by the Ukrainian Maritime Authority. It was duly recognised as being in accordance with the provisions of Regulation I/10 of the STCW Convention and endorsed by the Commonwealth of the Bahamas on 17th October 2016.

This was his first trip as Second Officer having completed his cadetship with CMA CGM.

- 3.1.8 The Chief Engineer, a Ukrainian national held a Chief Engineer Certificate issued by the Ukrainian Maritime Authority. It was duly recognised as being in accordance with the provisions of Regulation I/10 of the STCW Convention and endorsed by the Commonwealth of the Bahamas on 11th March 2016.

- 3.1.9 The Bosun along with the rest of the deck crew was from the Philippines. He had more than a decade of experience at sea and had been working with CMA CGM since 2007.

² Specification of minimum standard of competence for Masters and Chief Mates on ships of 500 GT or more

- 3.1.10 The Master and Chief Officer were experienced Officers with significant amounts of their sea service having been on container vessels. The Master who had been with CMA CGM since 2012 had previously sailed as Master for Mediterranean Shipping Company (MSC). This was his second trip as Master on ‘CMA CGM Berlioz’. He had joined the vessel on 22nd February 2017 at Jebel Ali, UAE. The Chief Officer had worked with CMA CGM since 2013 and was on his 3rd trip as Chief Officer. He had joined the vessel at Ambarli, Turkey on 12th March 2017. When he joined, the riding team were already on board.
- 3.1.11 The four members of the maintenance riding team were all Indian nationals and were employed by Aries Marine, Dubai, UAE. They had joined the vessel at Jebel Ali on 22nd February 2017 and were charged with the task of hydro washing, cleaning and painting of the vessel’s aft peak tank.
- 3.1.12 The four members of the riding team had spent varying amounts of time on vessels. The foreman had worked for Aries for three years but had been sailing as part of riding gangs since 2011. He was previously employed in a large Middle East located dry docks complex as a blaster / painter. This was the first CMA CGM vessel he had worked on but he had worked on other vessels with two of his team members.
- 3.1.13 Two of the other riding team members had worked together and with the foreman on several other vessels. They were experienced at working in confined spaces.
- 3.1.14 For the fourth member of the riding team and who is the subject of this report, this was his first experience of working on a vessel at sea.
- 3.1.15 The records available on board show that all four members of the riding team had completed their on-board familiarisation training upon joining the vessel. This was in accordance with the operator’s Safety Management System.
- 3.1.16 The members of the riding team were provided with and thought to be wearing appropriate personal protective equipment as specified in the operator’s Marine Procedure Prev-021³.

3.2 Port State, Flag State and Class Inspections

- 3.2.1 The last Port State Control inspection (Riyadh MOU) was carried out by Saudi Arabian Authorities at Jubail on 13th February 2017. No deficiencies were identified.

³ CMA CGM Prevention Manual, Marine Procedure, Card No. Prev-02, Version 03 2015-02-01, Use of Hydro blaster

- 3.2.2 The next Bahamas Annual Safety Inspection (ASI) is due on 23rd June 2017.
- 3.2.3 The vessel fulfilled the required surveys mandated by the International Conventions and as described under the Harmonised System of Survey and Certification A.1053(27) as amended with the following completion dates:

Renewal Survey	2 nd July 2016
Intermediate Survey	Due window 20 th April 2018 to 20 th October 2019
Annual Survey	2 nd July 2016 (for renewal)

3.3 Fatigue

- 3.3.1 Records indicate that all the vessel's crew were working in compliance with the statutory hours of rest requirements⁴.
- 3.3.2 The three bridge navigational Officers were maintaining 12 to 4, 4 to 8 and 8 to 12 watches and each watch was assigned with watch keeping ratings.
- 3.3.3 The Chief Officer was on permanent day work routines.
- 3.3.4 As they were classed as supernumeraries rather than crew, the riding team members were not required to complete hours of rest records. They were contracted to work for 10 hours per day. Their daily routine which started at 06:00 each morning and ended at 17:00 each evening provided for 10 working hours excluding coffee and meal breaks.

Based on this working pattern, there is no evidence to suggest that the riding crew would have been suffering from rest deprived fatigue.

3.4 Substance Abuse

- 3.4.1 Although no alcohol testing was carried out post incident, there was no evidence to suggest that substance abuse was a contributory factor. The Drug and Alcohol policy is displayed throughout the vessel prohibiting the use and consumption of drugs and alcohol onboard.

3.5 Charts and Publications

⁴ In compliance with the Maritime Labour Convention 2006, as amended, in particular regulation 2.3 prescribing hours of work or rest

- 3.5.1 The chart in use at the time of the incident was BA159 Suez to Berenice. It was received on board on 25th February 2016. The investigation confirmed that it was up to date with all corrections applied at the time of the incident.
- 3.5.2 The other prescribed publications carried on board were all found to be current editions that were up to date at the time of the incident.
- 3.5.3 The investigation verified the operational status of navigational equipment and met record keeping requirements.

4 RIDING TEAM WORK LOCATION

4.1 Description of Aft Peak Tank & Steering Flat

- 4.1.1 The riding team had been employed by the vessel Owners to clean and paint the aft peak ballast tank. The primary method employed for cleaning the tank was by hydro-blasting the internal surfaces. Once washed and any dislodged residues had been removed from the tank, it was then to be painted.
- 4.1.2 The aft peak tank is located at the stern of the vessel under the steering flat with its transverse centre matching the centre line of the vessel. The tank is bordered on its port and starboard sides by No. 5 port and starboard void tanks.
- 4.1.3 Longitudinally the tank extends aft from the Aft Perpendicular to the transom (at frame -8.5) and forward from the Aft Perpendicular to frame 14. The Bulkhead at frame 14 separates the tank from Container Hold No. 8.
- 4.1.4 At its aft end the tank is approximately 2000mm in height extending to some 5000 mm in height at frame 14. See figure 1 below for details.

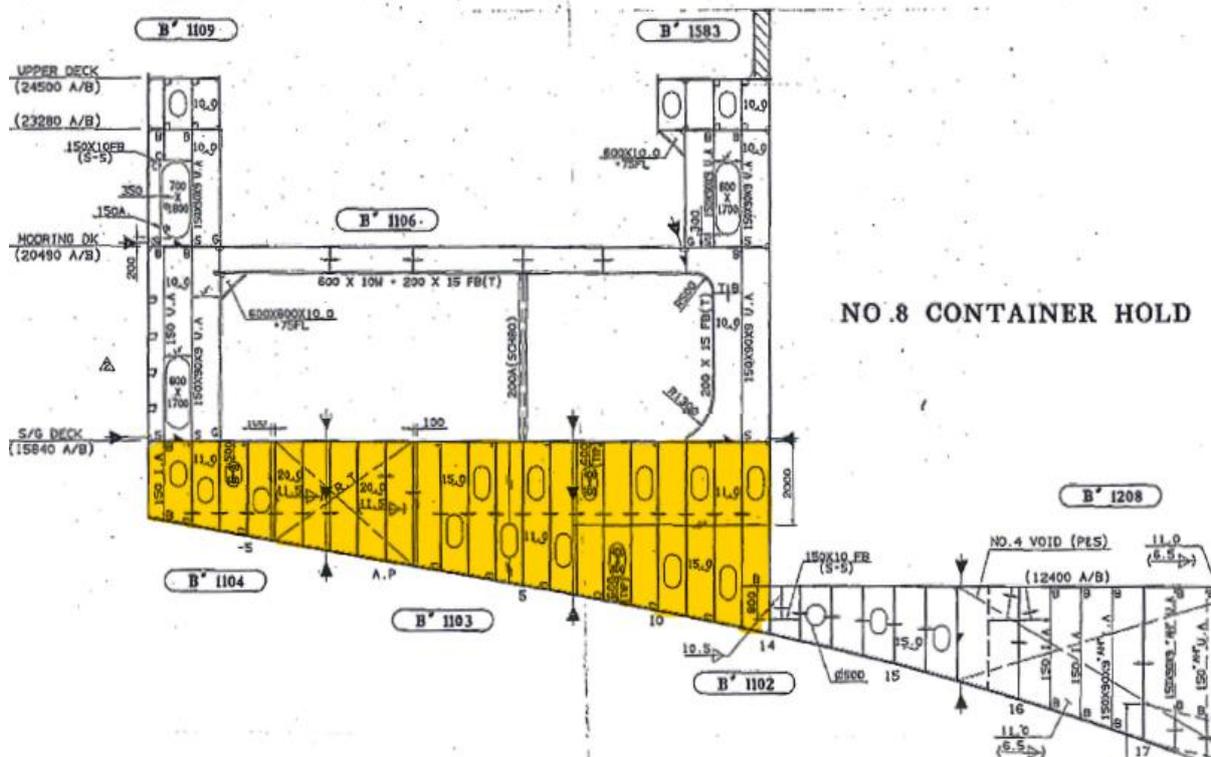


Figure 1: Structural cross section of vessel showing aft peak tank location highlighted in yellow

4.2 Access Details

- 4.2.1 The primary access to the steering flat is via the stairwell located to starboard of the centreline. The stairwell links the mooring deck to the steering flat level. At the mooring deck level the stairwell is secured with a weathertight door. Two flights of steps go down to a lobby area off which the CO₂ room and the steering flat are accessed through steel doors to the starboard and port sides respectively.



Figure 2: Entrance door to steering flat from mooring deck

- 4.2.2 On the port side of the steering flat and accessed via a vertical ladder is an emergency escape booby hatch that exits onto the forward port side of the mooring deck.
- 4.2.3 Access to the aft peak tank is via four man holes. Of the four man holes, three are located within the steering flat and one is located under the stairs in the stairwell located to the starboard side between the steering flat and the CO₂ room. Refer to figure 3.

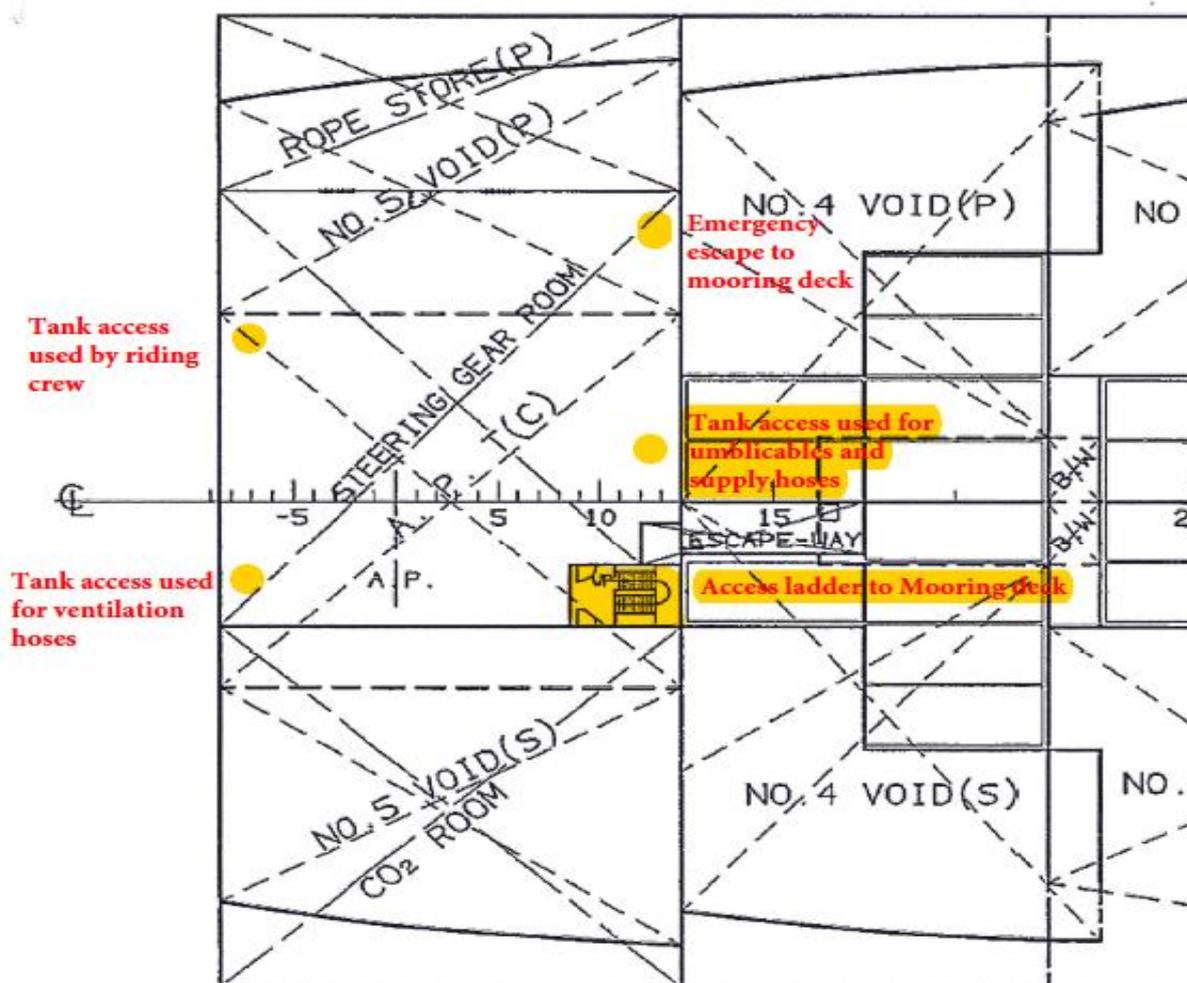


Figure 3: Plan view of steering gear room, aft peak tank, CO₂ room and access points

- 4.2.4 Although all four manholes were opened during the maintenance works. One was being used for personnel access. Two of the other openings provided conduits for ventilation, umbilicals and hoses. The tank lid located under the stairs in the main stairwell was barricaded off as it was located outside of the steering flat.
- 4.2.5 A supply of drinking water was kept outside the tank between the two after aft peak tank lids in the steering flat.
- 4.2.6 The riding gang foreman, who acted in the capacity of the external safety person, was situated on a chair for the duration of the works by the tank lid used for tank access. From this position, he had line of sight to all three tank lids within the steering flat and the emergency escape ladder.

- 4.2.7 From his seat the foreman had no line of sight to the stairwell access door as the steering gear was located between the two positions and fully obstructed the view as seen in figure 4.



Figure 4: Foreman's view of stairwell access door obstructed by the steering gear

- 4.2.8 The hydro-blasting machine was located outside the steering flat on the upper deck between container bays 66 and 70. The hoses between the hydro-blaster and the jetting gun were run down through the emergency escape hatch and into the aft peak tank via the forward tank lid.
- 4.2.9 The foreman would stop and start the hydro-blaster as required. His normal access route between the tank entrance and the machine was via the emergency escape hatch and external stairway located on the port side of the mooring deck.
- 4.2.10 The blasting team inside the tank was formed of the two experienced team members. One would operate the jet gun and one would provide illumination with a hand-held torch. The only other light was provided by head lamps mounted on their helmets. The two senior members of the team would rotate duties between mornings and afternoons.

- 4.2.11 The remaining man, being inexperienced, was assigned as the in-tank safety man. His position was in the compartment next to the bottom of the tank access ladder from the manhole. His role was to keep watch on the hydro-blasting team and co-ordinate between them and the safety standby man (foreman) located outside the tank.
- 4.2.12 On the day of the incident the hydro-blasting team was working some 5 bays away from the access ladder and were not directly visible to the in tank standby man. He was also not visible to the external standby man.



Figure 5: View through tank to work site from standby man position.



Figure 6: View of tank access ladder from standby man position

4.3 Riding Team Arrangements & Daily Working Schedule

- 4.3.1 The riding team were all accommodated together in the Suez cabin located on the aft end of the port side upper deck level of the accommodation block. The accommodation block is located towards the aft end of the vessel between container bays 54 and 58.



Figure 7: Entrance to the Suez cabin located on the upper deck

- 4.3.2 The Suez cabin has no direct access to the accommodation but is accessed through a lockable weathertight door leading directly on to the upper deck. The cabin contains three sets of bunk beds of which the riding gang utilised two sets.
- 4.3.3 The riding team took their meals in the crew mess room with the crew. They were reported as generally sitting together and talking between themselves. There was little interaction other than courtesy greetings between the riding team and the ship's crew due to a lack of a common language.
- 4.3.4 The riding team were employed to work 10 hours per day. Their working day was structured as follows:

05:30	Wake up. Foreman to deck office to collect radio and multi-gas detector.
06:00	Commence work in aft peak tank
07:20	Stop work – exit tank
07:30	Breakfast in crew messroom
07:50	Foreman meets with Chief Officer in deck office to collect daily Permits to Work ⁵ .

⁵ CMA CGM Prevention Manual, Marine Tool, *Card No. Prev-024*, version 04 2015-05-01 – Permit for work in enclosed space.

CMA CGM Prevention Manual, Marine Tool, *Card No. Prev-022*, version 02 2015-02-01 – Permit for use of Hydro Blaster.

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08:00 Working in tank
09:55 Tea-break. Generally, the hydro-blasting team stayed inside tank for the tea break to avoid having to remove their PPE. If painting was ongoing the whole team would take the break together in the steering flat.
10:25 Working in tank
11:45 Chief Officer check on riding team.
11:50 Stop work – exit tank
12:00 Lunch break in crew mess
12:30 Working in tank
14:55 Tea-break
15:25 Working in tank
16:55 Finish work for the day.
17:15 Foreman meeting with Chief Officer in deck office. Signing off Permits to Work. Returning radio and multi-gas detector.
Riding team returning to cabin.
18:00 Dinner in crew messroom.
18:30 Returning to cabin to watch movies on their telephones or foreman's laptop.

- 4.3.5 The nearest toilet facilities to the steering flat space are located at the rear of the accommodation block on the starboard side of the upper deck adjacent to the starboard side accommodation entrance door. It is about a three minute walk from the steering flat to the toilet.

5

NARRATIVE OF EVENTS

- 5.1.1 On 21st March 2017, the vessel was on normal sea routines whilst enroute to Jeddah, Saudi Arabia having transited the Suez Canal southbound the previous day.
- 5.1.2 The riding gang were employed for hydro-blasting the aft peak tank. The foreman had collected the radio and multi-gas detector as usual and tested the tank before work commenced at 06:00 hrs.
- 5.1.3 The area being cleaned was approximately five frames away from the access ladder. The team was in their customary positions with the junior team member stationed at the foot of the access ladder inside the tank.
- 5.1.4 At 07:50 following breakfast, the foreman collected the daily Permits to Work from the Chief Officer in the deck office.
- 5.1.5 The weather conditions at 08:00 hrs. were recorded in the deck logbook as wind NW 3, sea state 2⁶, temperature 23°C, 1017 on the barometer and good visibility.
- 5.1.6 The deck crew including the Bosun, were employed chipping and painting on the starboard side deck in way of container bay 10.
- 5.1.7 At about 08:15 hrs the Bosun reported that the riding gang foreman went to see him at Bay 10 to report that one of the hose connectors on the hydro-blaster had failed. The Bosun went to the hydro-blaster location and spent approximately 20 mins repairing the hose connector with the assistance of the foreman and the junior riding team member.
- 5.1.8 The morning break was taken by the water jet operators and the in-tank standby man inside the tank between 09:55 and 10:25 hrs. The two operators reported that the in-tank standby man made his way through the tanks frames to request some drinking water from them.
- 5.1.9 Work restarted at the end of the break. At 10:40 hrs., the in-tank standby man exited the tank and appeared to indicate to the foreman that he was going to urinate. He was last seen walking round the steering gear towards the starboard stairwell.

⁶ Beaufort Scale of wind force general specifications for observations on board ships (open sea): Small wavelets; crests of glassy appearance, not breaking.

- 5.1.10 It appears that rather than walking to the deck toilet, it was normal practice for the riding gang to urinate through the poop deck aft rails, over the transom.
- 5.1.11 Even though the man had not returned to the steering flat by 11:00 hrs. the foreman was not unduly concerned. He assumed the man had an upset stomach and was still in the bathroom or had returned to their cabin.
- 5.1.12 When the Chief Officer arrived at the tank entrance on his pre-lunch rounds around 11:45 hrs., he was advised by the foreman that everything was OK. No enquiry was made by the foreman of the Chief Officer, asking if he had seen the absent man despite it being one hour since he had left the steering flat.
- 5.1.13 At 11:55 hrs. the foreman exited the steering flat through the emergency escape up to the upper deck to turn off the hydro-blaster. He stopped on the mooring deck on his way back to the steering flat to help the deck cadet and Chief Officer to rig netting for a later planned football game.
- 5.1.14 At 12:00 hrs. the temperature had increased to 28°C, the sea state was now 3⁷ and there was gentle breeze recorded. Other recorded parameters were unchanged.
- 5.1.15 Once the hydro-blaster had been turned off, the remaining two members of the riding gang exited the aft peak tank for lunch. They, along with the foreman went to check the deck bathroom and their cabin for the missing man.
- 5.1.16 Having failed to locate their colleague, the riding team advised the Chief Officer at 12:40 hrs. of the situation. The Chief Officer immediately called the bridge and the Master to advise of a possible man overboard incident.
- 5.1.17 At 12:45 hrs. the general alarm was sounded and all personnel, except the riding crew, mustered at the assigned muster station on deck 'A'.
- 5.1.18 A head count was taken at 12:48 hrs. and the approved ISPS vessel search plan was instigated.
- 5.1.19 The ISPS search of the vessel commenced at 13:00 hrs. and was co-ordinated by the Chief Officer. All shipboard personnel both on and off watch were utilised. All decks, cargo holds, machinery spaces, accommodation spaces and store rooms were searched at least once and in some cases two or three times.

⁷ Beaufort Scale of wind force general specifications for observations on board ships (open sea): Large wavelets; crests begin to break; scattered whitecaps.

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- 5.1.20 The riding crew did not muster as the Chief Officer had dispatched them to complete a compartment by compartment search of the whole aft peak tank.
- 5.1.21 Meanwhile the Master and OOW had plotted the 10:40 hrs. position and established this as the Man Overboard (MoB) datum point. The vessel was turned around and steamed a reciprocal course back to the likely MoB position.
- 5.1.22 The vessel also started communications with MRCCs and the vessel's operators. At 13:24 hrs. a call was made to the CMA CGM emergency line which convenes the Crisis Response Team. The vessel's DPA was advised of the incident by telephone at 13:28 hrs.
- 5.1.23 Distress messages were transmitted at 13:30 hrs. and the first MRCC to acknowledge was Oslo. The email and telephone numbers listed in the ALRS for the nearby MRCC centres were found to be not functioning or were not being answered. Eventually the correct contact details were obtained for JRCC Cairo. Although JRCC Cairo were sent a message from the vessel via Sat 'C' and advised the Master by telephone that they also required email confirmation to act fully. A Hotmail email account address was provided by the JRCC.
- 5.1.24 Other vessels in the area were alerted by radio from the vessel and via a Navtex message issued by JRCC Cairo notifying them to keep a sharp lookout when passing through the immediate vicinity. Numerous vessels made contact by radio and offered to render assistance by posting extra lookouts whilst passing through the area.
- 5.1.25 The vessel arrived back at the MoB datum point at 15:10 hrs. and commenced an expanding square search.
- 5.1.26 Upon commencement of the search, the vessel was put into hand steering and all available personnel deployed as lookouts on high vantage points which included; bridge wings, the upper deck, foc'sle and stern.
- 5.1.27 The weather during the search was reported as being good with slight seas and good visibility. The sea height increased towards nightfall with winds of about 12 knots being reported.
- 5.1.28 Sunset on 21st March at the search location was at 18:48 hrs. with total darkness some 30 mins later.
- 5.1.29 When darkness fell, the search continued with searchlights and other available overboard lights.

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- 5.1.30 The Egyptian navy reported sending a plane to assist with the search but this was not sighted by the ship. An Egyptian naval vessel arrived on scene at 20:10 and having established radio communications with ‘CMA CGM Berlioz’, commenced SAR operations.
- 5.1.31 At 20:20 hours, the Master concluded that it was too dark to continue searching effectively and it was almost 10 hours since the person was presumed to have fallen overboard. Therefore, he took the decision to resume the vessel’s passage to Jeddah.
- 5.1.32 This decision was conveyed to JRCC Cairo who acknowledged the ship leaving the search area at 21:20 hrs.
- 5.1.33 JRCC Cairo reported three surface vessels and one aircraft were deployed by the Egyptian authorities and that they continued the search into the following day, 22nd March, without success.
- 5.1.34 The vessel arrived in Jeddah on 22nd March 2017. A local surveyor appointed by the vessel’s P&I Club attended on board and interviewed the three remaining members of the riding team.

6

ANALYSIS AND DISCUSSION

6.1 Procedures

- 6.1.1 The Company Safety Management System was reviewed during the course of the investigation specifically in relation to guidance provided within the SMS in regard to the presence of 3rd party contractors sailing with the vessel; for guidance on the pre-qualification of contracted companies; for guidance on the type and level of on board training provided to 3rd party contractors; for guidance on working with hydro-blasting equipment; for guidance on the testing of tank atmospheres; for guidance on entry into an enclosed space and working therein; for guidance on the use of PPE; and for emergency procedures in place for Man Overboard incidents.
- 6.1.2 Two sets of guidance were found in the SMS⁸ relating to the presence of 3rd party contractor / visitors on board. In the guidance for contractors it states that the working language on board is English. The minimum requirement is for the team supervisor to be English speaking.
- 6.1.3 The riding team foreman was found to be able to speak and understand English to a satisfactory level. It was difficult to determine the exact level of fluency of the English language for the other two team members due to them appearing nervous and anxious during the interview process. Examination of the missing person's effects showed that he had a proficient level of written English.
- 6.1.4 Under the heading Administrative Matters, the guidance for contractors lists three documents the Master must collect from the contractors. These are their passports, visa(s) if required and vaccination(s) if required. This section does not contain any guidance for completion of familiarisation training.
- 6.1.5 Documentary evidence of the completion of Boarding Familiarization Questionnaires⁹ by all the riding team members was sighted on board the ship. It is stated on the document that it *'must be filled up by the on signer and given to the Chief Officer before the ship leaves port'*. The completed document is to be signed by the on signer and the Chief Officer.

⁸ CMA CGM Prevention Manual, Marine Procedure, *Card No* Prev-070, Version 01 2014-02-01, Visitors on board vessels

CMA CGM Prevention Manual, Marine Tool, *Card No* Prev-008, Version 01 2014-02-01, Contractors on board - tool

⁹ CMA CGM Prevention Manual, Marine Tool, *Card No* FAM-002, Version 04 2016-03-01, Boarding familiarization questionnaire

- 6.1.6 The Boarding Familiarization Questionnaire does not provide any indication of the level and type of familiarization training given or who the trainer was. All four familiarization forms completed by the riding team members were noted as having identical answers and in good written English. The one said to have been completed by the missing man was compared with another sample of his hand writing and verified as likely written by the same person. It was not determined whether the remaining three familiarization forms were filled in by the other three riding team members.
- 6.1.7 As the Chief Officer who had been on board and responsible for completing the familiarization process had left the vessel it was not possible to establish the facts surrounding the completion of the actual induction process. Nor was it possible to establish the level of training provided by the riding team's employers prior to them joining the vessels. This is particularly relevant in the case of first trip personnel.
- 6.1.8 The SMS provides detailed guidance about working in an enclosed space¹⁰. The guidance provides pertinent information about the duties of personnel associated with the works and the issuing of the Permit to Work. For the Attendant person, it states: *'...must stay at entry and must strictly not leave. Ensure communication with worker and officer of the watch. Can be anyone from the crew. Should register all entry / exit of the enclosed space.'*
- 6.1.9 The foreman who was the attendant person had no direct communication with the persons in the tank, he was not a member of the crew and there was no evidence of any entry / exit register being maintained.
- 6.1.10 The guidance states that the 'Authorizing Officer / Responsible Person (top officers)' *'signs the permit'* and is *'In charge of checking atmosphere with gas detector'*. The practice on this vessel was for the riding team foreman to test the tank atmosphere at 06:00 hrs and then for the Chief Officer to sign the Permit to Work at 08:00 hrs. These actions contravene the SMS procedures.
- 6.1.11 The SMS provides guidance for PPE requirements both generally¹¹ and task specific in a PPE Matrix¹². The PPE specified as required for high pressure equipment in the Matrix was reported as being fully utilised by the riding team.

¹⁰ CMA CGM Prevention Manual, Marine Procedure, *Card No* FAM-023, Version 06 2017-01-01, Work in an enclosed space

¹¹ CMA CGM Prevention Manual, Marine Procedure, *Card No* Prev-010, Version 02 2014-02-01, Personal Protective Equipment

¹² CMA CGM Prevention Manual, Marine Tool, *Card No* Prev-011, Version 03 2015-12-01, Personal Protective Equipment Matrix

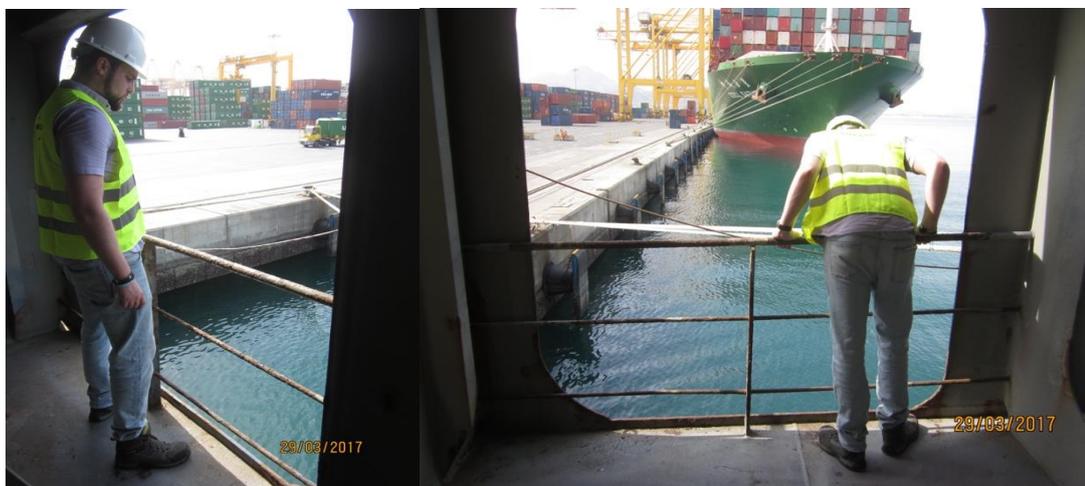
- 6.1.12 The SMS provides procedures for the use of Hydro-blasting equipment¹³. The procedures specify that when the level of use is different to the area (location) of the machine, there must be one operator, one assistant within ear / sight shot and a third person in half way between the operator and the assistant with a hand-held radio.
- 6.1.13 The standby man at the base of the ladder inside the tank was not in sight contact with the operator and he was not equipped with a hand-held radio and had to climb a ladder to reach and communicate with the foreman outside the tank. The foreman then had to ascend a vertical ladder and external stairways to reach the machine to be able to stop it.
- 6.1.14 No documentary evidence was sighted to support the requirement within the Company procedures that *‘every user of the Hydro Blaster must have read completely the instruction manual before start-up’*.
- 6.1.15 Therefore, the arrangements in place regarding the operation of the hydro-blaster contravened the written procedures.
- 6.1.16 During the investigation, it became apparent that the riding team commonly used the mooring deck aft rails as their urinal rather than walking to the deck toilet. The practise of urinating over the ship’s side, whilst commonplace is a potentially hazardous act especially for novice seafarers.
- 6.1.17 The section of aft rails on the starboard side of the mooring deck identified by the riding team as their preferred urinal (Fig. 8) were found to be in good condition and of an appropriate height. Outside of the railings a steel wire was rigged between strong points across the transom. This is used for hanging razor wire when the vessel transits high risk piracy areas. At the time of the incident the razor wire was not rigged but the rigging wire was.

¹³ CMA CGM Prevention Manual, Marine Procedure, *Card No* Prev-021, Version 03 2015-02-01, Use of Hydro blaster



Figure 8: Vessel transom showing subject section of ship's side rails

6.1.18 The investigation looked at how feasible it would be to fall over the stern whilst relieving oneself. It was thought unlikely, given the slight sea conditions at the time of the incident, unless a person were to stand on the 1st or 2nd rail, that an accidental fall would likely occur. The individual in figures 9 & 10 was reported as being just marginally taller than the missing man.



Figures 9 & 10: The aft railings identified as the area used by the riding team.

6.1.19 During the interview with the riding team foreman he stated that when the team finished work at 11:55 hrs. they went to check the deck toilet and their cabin for the missing man. This latter reported action seems slightly odd as it was established during the interviews that the riding team had only one key to the cabin and this was kept in the possession of the foreman. It was confirmed that the missing man had not asked for the key on his way out of the tank.

6.1.20 The two other riding team members were noted as being very anxious and nervous during the course of the investigation. Their limited understanding of English observed during the interview and the requirement to have the foreman translate their answers left the investigator to question whether they provided full disclosure about the sequence of events on 21st March 2017.

7

CONCLUSIONS

- 7.1 A member of the riding team disappeared from the vessel on 21st March 2017 whilst the vessel was transiting through the northern Red Sea. Despite comprehensive searches of the vessel being completed, the individual was not located and the loss has been categorised as a man overboard incident. Whether the loss of the individual was accidental, deliberate or assisted will likely never be established.
- 7.2 The subsequent investigation identified several pertinent issues. These cannot be directly attributed to the whereabouts or circumstances surrounding the missing 3rd party contractor, however they do identify that improvements can be made to Company procedures relating to the supervision and management of 3rd party contractors sailing with the vessel.
- 7.3 There was a lack of detailed procedural guidance available to ship's staff regarding the training and supervision of 3rd party contractors sailing on the vessel. It cannot therefore be determined with any credibility the extent and detail at which induction training was being delivered.
- 7.4 Adequate supervision of the work was not in place as per the Company SMS procedures. The testing of the tank atmosphere prior to the work starting each day was not completed by the appropriate person, namely a senior officer. Similarly, allowing the work to commence several hours before the Permits to Work were issued was not in compliance with Company procedures.
- 7.5 The procedures in place for the operation of Hydro-blasting equipment were not adhered to in terms of the positioning of personnel. This is further evidence of insufficient supervision of the works.
- 7.6 The investigation was unable to determine the level of understanding of the English language of all riding team members. It cannot therefore be determined whether the induction training delivered was understood by all members of the riding team. The bridge records were determined to be thoroughly completed. On review, no incidents were recorded within the Ship's log which may indicate that the induction training was incomplete or not fully understood by all personnel on board.
- 7.7 There was a lack of supervision by the riding team foreman in knowingly allowing his team to use the aft rails as a urinal instead of making them utilise the deck toilet.

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- 7.8 There was a lack of awareness and responsibility by the riding team foreman in not raising the issue of the missing person until two hours after he was last sighted leaving the tank.
- 7.9 It could not be determined with any certainty the whereabouts of the third-party contractor during the course of this investigation.

8

RECOMMENDATIONS

Recommendations for the Operator:

- 8.1 The Company is recommended to consider a review of their Safety Management System with respect to the training and supervision of 3rd party contractors on board their vessels.
- 8.2 The Company should ensure that familiarization and ongoing training provided to contractor’s personnel whilst on the vessel is appropriate to their level of experience and role on board.
- 8.3 The Company should ensure that training provided by Contracted 3rd party companies to their employees prior to deploying them to a vessel is verified by the vessel operators.
- 8.4 The Company should ensure that their internal audit procedures are robust enough to identify whether procedures put in place are followed by on board personnel.
- 8.5 The Company should consider requiring all personnel working on their vessels to have a working knowledge of the vessel’s designated working language.

9

ACTIONS TAKEN

- 9.1 A full review of the Company SMS with regard to 3rd parties on board all vessels will be undertaken. The scope of this review will include;
 - 9.1.1 Combining the three different types of 3rd parties (passengers, contractors and visitors) into one procedure.
 - 9.1.2 Reviewing the familiarisation carried out on board.
 - 9.1.3 Ensuring a sufficient level of training and language prior to boarding.
- 9.2 An additional ISM audit will be carried out on board to ensure the SMS, with special regard to the permit to work and risk assessment procedure, is fully understood and is being implemented properly and correctly. The audit will include an in-depth training session for all crew concerned.
- 9.3 A review of the CMA Ships/CMA CGM Terms & Conditions for 3rd parties and the internal purchasing system will be conducted.

10

LIST OF APPENDICES

- A. Additional photographs

APPENDIX A – ADDITIONAL PHOTOGRAPHS



1. Mooring deck looking from port to starboard



2. Razor wire rigging wire outboard of the aft rails



3. Navigational chart extract showing MoB location



4. Aft peak tank man hole used for access. The foreman sat on a chair to the right side of the white handrails



5. View across steering gear forward end to stairwell access door