

Combined report on the investigations of
Two fatalities connected with the
operation of the workboat

GPS Battler

off Almeria, Spain

on 13 August 2014

and

in Marin, Spain

on 6 January 2015



Extract from
The United Kingdom Merchant Shipping
(Accident Reporting and Investigation)
Regulations 2012 – Regulation 5:

“The sole objective of the investigation of an accident under the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 shall be the prevention of future accidents through the ascertainment of its causes and circumstances. It shall not be the purpose of an investigation to determine liability nor, except so far as is necessary to achieve its objective, to apportion blame.”

NOTE

This report is not written with litigation in mind and, pursuant to Regulation 14(14) of the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012, shall be inadmissible in any judicial proceedings whose purpose, or one of whose purposes is to attribute or apportion liability or blame.

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For all enquiries:

Marine Accident Investigation Branch

Spring Place

105 Commercial Road

Southampton

United Kingdom

SO15 1GH

Press enquiries during office hours: 020 7944 4166 / 3176

Press enquiries out of hours: 020 7944 4292

Email: maib@dft.gsi.gov.uk

Telephone: +44 (0) 23 8039 5500

Fax: +44 (0) 23 8023 2459

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

BAC	-	Blood Alcohol Concentration
BMI	-	Body Mass Index
CCTV	-	Closed Circuit Television
ENG1	-	A seafarer's medical examination
hp	-	horsepower
ISO	-	International Standards Organisation
m	-	metre
mg	-	milligram
MGN	-	Marine Guidance Note
ml	-	millilitre
QMS	-	Quality Management System
RIB	-	rigid inflatable boat
RYA	-	Royal Yachting Association
SMS	-	Safety Management System
STCW	-	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978, as amended (STCW Convention)
UTC	-	Universal Time Co-ordinated
VHF	-	Very High Frequency (radio)

TIMES: time zones used in this report are as indicated

SYNOPSIS

On 13 August 2014, the master of the UK registered workboat *GPS Battler* drowned soon after the open tender returning him from the marina in Almeria, Spain, to his anchored vessel, was overwhelmed in choppy seas. The tender flooded rapidly and started to submerge. The master initially swam clear but soon lost consciousness and could not be revived. *GPS Battler's* mate, who was with the master, was recovered from the water uninjured. The semi-submerged tender later foundered while being towed to the shore. There was no pollution.

Less than 5 months later, on 6 January 2015, a mate joining *GPS Battler* fell into the water from the quayside in Marin, Spain while waiting for the access arrangements to the vessel to be made safe. The mate was soon motionless and the crew were unable to recover him from the water. The mate was eventually recovered on board a rigid inflatable boat operated by the Spanish coastguard. He had been in the water for almost 1 hour and he had drowned.

The investigations identified that elements of the safety management system on board *GPS Battler* were not followed. Notably, the alcohol consumption by the deceased and other crew members, which was a factor in both accidents to varying degrees, was contrary to the workboat's drug and alcohol policy. The deceased in the first accident was 25% over the UK's drink-drive limit and the deceased in the second accident was almost four times over the limit. Both accidents highlight the difficulties encountered in implementing effective safety management and safe systems of work on small boats such as workboats.

Following the accidents GPS Marine Contractors Ltd, *GPS Battler's* operator, has taken action aimed at improving the effectiveness of the safety management system on board its workboats, including workboats operating 'out of area'. It has also taken action to better monitor crews' adherence to its drug and alcohol policies. A recommendation has been made to GPS Marine Contractors Ltd which is aimed at ensuring the effectiveness of the actions it has already taken.

SECTION 1 - PARTICULARS OF *GPS BATTLE* AND ACCIDENTS

SHIP PARTICULARS		
Vessel's name	<i>GPS Battler</i>	
Flag	UK	
Classification society	Bureau Veritas	
IMO number/fishing numbers	873328	
Type	Workboat	
Registered owner	GPS Battler Ltd	
Manager(s)	GPS Marine Contractors Ltd	
Construction	Steel	
Year of build	2009	
Length overall	21.60m	
Registered length	20.250	
Gross tonnage	90	
Minimum safe manning	4 (2 when within 20nm of a safe haven)	
Authorised cargo	Not Applicable	
VOYAGE PARTICULARS	13 August 2014	6 January 2015
Port of departure	Mahon, Spain	Marin, Spain
Port of arrival	Almeria	Marin, Spain
Type of voyage	Coastal	Not applicable
Cargo information	Towed barge	Not Applicable
Manning	4	4
MARINE CASUALTY INFORMATION		
Date and time	13 August 2014 at 1845 (UTC+2)	6 January 2015 at 0139 (UTC+1)
Type of marine casualty or incident	Very Serious Marine Casualty	Very Serious Marine Casualty
Location of incident	Almeria, Spain	Marin, Spain
Place on board	Overside	Ashore
Injuries/fatalities	1 fatality	1 fatality
Damage/environmental impact	None	None
Ship operation	At anchor	Alongside
Voyage segment	At anchor	Alongside
External & internal environment	Moderate breeze; choppy seas; good visibility. Daylight.	Light breeze; rippled sea; good visibility. Darkness.
Persons on board	4	3



GPS Battler

SECTION 2 - OPERATION AND MANAGEMENT

2.1.1 GPS Battler

GPS Battler was built in 2009 by the Neptune Shipyard, Netherlands to a standard workboat design. The workboat was owned by GPS Battler Ltd, operated by GPS Marine Contractors Ltd and was used mainly for towing operations.

In April 2014 *GPS Battler* was contracted to assist a dredging operation in Mahon, Menorca, Spain. The workboat was certified for operation under the requirements of Marine Guidance Note 280(M) - Small Vessels in Commercial Use for Sport or Pleasure, Workboats and Pilot Boats – Alternative Construction Standards.

2.1.2 GPS Marine Contractors Ltd

GPS Marine Contractors Ltd is based in Chatham, UK. It operates a fleet of 11 vessels which includes tugs, shoal busters and multi-cat workboats. The company also operates over 20 non-propelled barges and dredgers. Its operations include international, coastal and harbour towage, dredging and hydrographic surveying, transport of goods by barge and marine and civil engineering and construction.

The majority of the work undertaken by GPS Marine Contractors Ltd is based in the UK. However, in recent years its vessels have been involved in dredging operations in other parts of Europe.

GPS Marine Contractors Ltd operates a Quality Management System (QMS) to the International Standards Organisation (ISO) 9001:2008 standard and has developed a Safety Management System (SMS) that incorporates business, personnel and technical management activities. The SMS also articulates the company's policies, procedures and practices for its vessels and crews.

2.1.3 Safety Management System

The SMS on board *GPS Battler* predominantly covered the workboat's operations in the UK, particularly in the rivers Thames and Medway. The SMS included, among other things, crew roles and responsibilities, drug and alcohol policy, towing operations and anchor watches. The procedures also required the crew to wear lifejackets when working on deck and over-side. The workboat did not carry a tender and its crew were not expected to operate small boats while on board. Consequently, the SMS did not contain any instructions or procedures for the use of tenders or other small boats.

The company's drug and alcohol policy stated:

Personnel shall not consume any alcoholic beverages during the four (4) hours immediately preceding scheduled vessel operation / watch-standing duty.

Employees ashore, whilst the vessel is in port, must exercise restraint from excessive alcohol consumption such that on return to the ship, their blood alcohol concentration will not exceed 0.04%. Any level above this limit is considered as being impaired.

However it must be carefully noted that the Company requires all persons are required at all times to ensure that their Blood Alcohol Concentration (BAC) does not exceed 0.04% by weight or 40mg/100ml.¹ [sic]

The SMS required an effective bridge watch to be maintained while at anchor. It also stated:

The watch keeper should ensure the following:

- *The position of the vessel is frequently checked*
- *Correct lights and shapes are shown*
- *VHF watch maintained*
- *Passing traffic is monitored*
- *Weather conditions are monitored*
- *The master is called if in any doubt [sic]*

¹ Marine Guidance Note (MGN) 448 recommends that where an alcohol limit is included in company alcohol policies a limit of 0.05% or 50mg per 100ml is used. This limit accords with the requirements of Regulation VIII/I of the International Convention on Standards of Training, Certification and Watchkeeping (STCW). The current blood alcohol concentration limit for UK professional seafarers detailed in the Railways and Transport Safety Act 2003 is 0.08% or 80mg per 100ml – the same as the UK drink-drive limit.

SECTION 3 - ACCIDENT IN ALMERIA

3.1 FACTUAL INFORMATION

3.1.1 Background

GPS Battler sailed from Mahon, Menorca with the unmanned dredger *Von Rocks* (**Figure 1**) in tow on 6 August 2014 for passage to Marin on the north coast of Spain. The workboat was expected to complete the 1040 mile voyage before 3 September. No stops were planned.



Figure 1: *Von Rocks*

On 11 August, the master requested permission from GPS Marine Contractors Ltd to stop at Almeria, Spain in order to shelter from adverse weather conditions that had been forecast and to potentially repair a minor engine defect. The workboat's operator agreed but instructed the master to go to anchor in order to avoid paying port dues. *GPS Battler* anchored 110m south of the harbour breakwater in Almeria, Spain, the same day (**Figure 2**).

3.1.2 Narrative

At 0600² on 13 August, *GPS Battler's* master, Paul Heritage, arrived in the wheelhouse to take over the anchor watch from the mate. During the watch handover, the master and the mate agreed to go ashore in the afternoon using the tender carried on board *Von Rocks* (**Figure 3**) to purchase provisions and to have a meal.

² All times in this section are UTC (+2) unless otherwise indicated.

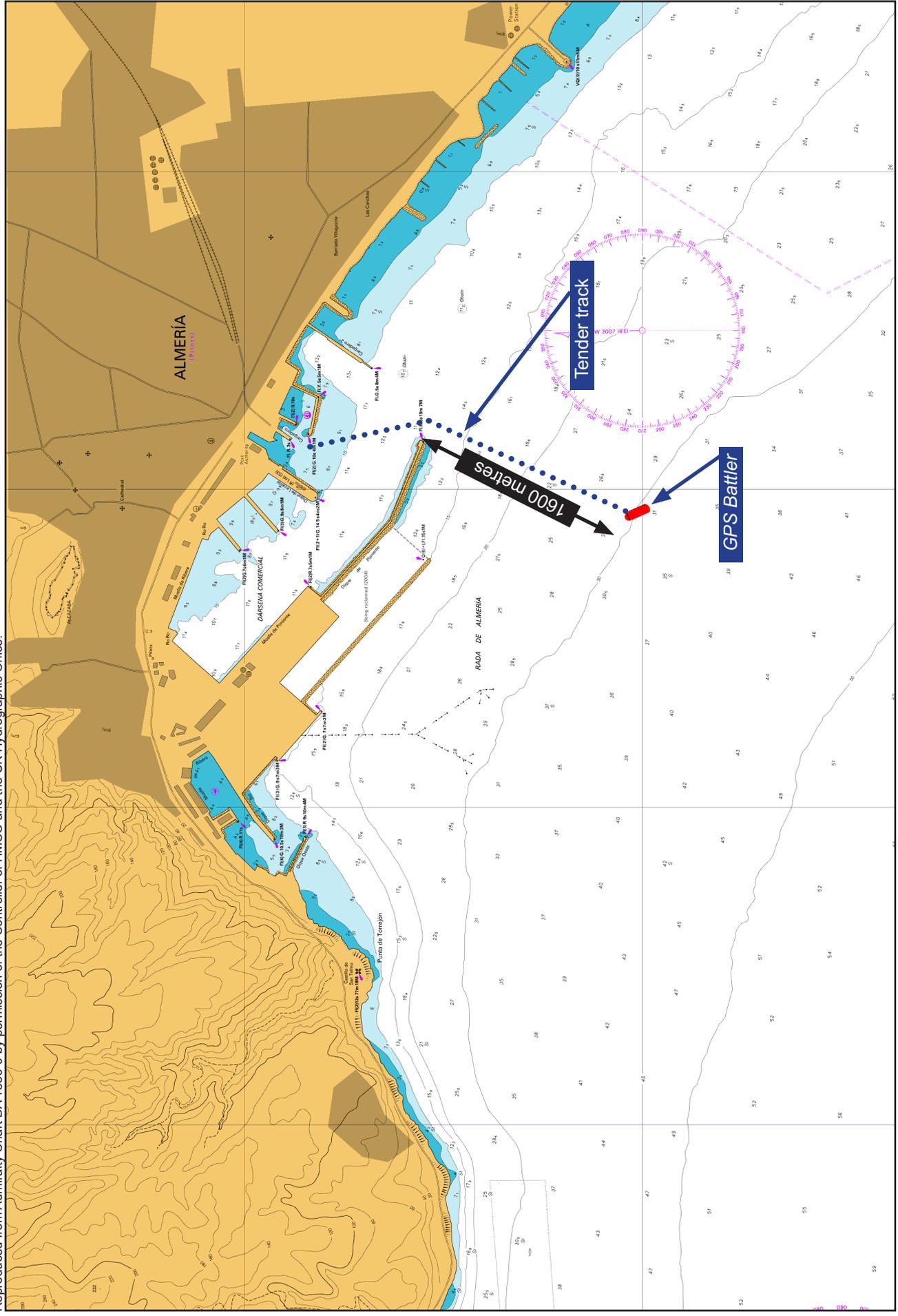


Figure 2: Plan of Almería port and anchorage position

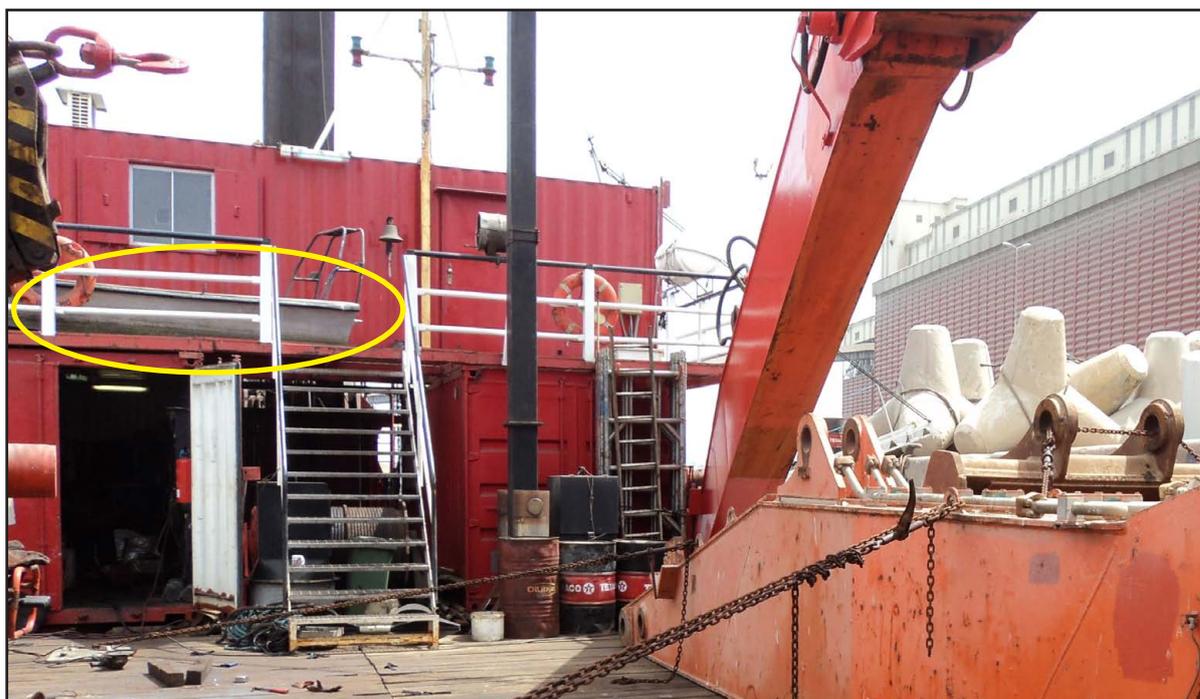


Figure 3: Tender stowed on *Von Rock's* deck

Between 1145 and 1215, the mate and the workboat's two engineer ratings shortened the towline between *GPS Battler* and *Von Rocks*. Shortly afterwards, the workboat's crane lifted the tender from the dredger onto *GPS Battler's* deck, where it was examined by the mate. The mate checked that there were no obvious defects and that there was sufficient fuel for the trip to the shore and back.

On completion, the mate informed the master that he was satisfied with the condition of the tender and that he was ready to go. He also suggested that they take lifejackets from *GPS Battler* with them, but the master rejected the mate's suggestion.

At about 1300, the tender was lowered into the water by the deck crane and secured alongside. The mate climbed down into the tender and started its outboard motor. The master then also boarded. Both men were wearing 'T' shirts and shorts with casual footwear, and were carrying personal mobile telephones; the master was also carrying the workboat's mobile telephone.

The tender set off towards Almeria's marina, which was approximately 1600m to the north. The tender had no difficulty during the passage; the wind was light and the sea was relatively calm. The tender arrived at the marina at 1359³. The master and the mate tied the boat alongside and headed towards the Club de Mar marina entrance. The men left the marina at 1407 and went into a bar just outside its road entrance. The master and the mate remained in the bar for about 30 minutes and each drank one small glass of beer.

The master and the mate then walked around Almeria, stopping at a second bar for about 30 minutes, where they each drank a glass of wine. The two men also spent about 1 hour in a supermarket where they purchased provisions, including wine and cigarettes, which they loaded into a trolley.

³ The timings of arrivals and departure to and from the marina by sea and by road are based on closed circuit television (CCTV) recordings.

The master and the mate arrived back at the marina at 1627 and unloaded the provisions from the trolley onto the tender. The master commented that the sea looked a bit choppy so he decided to wait for the conditions to improve. They exited the marina at 1630 and took the trolley back to the supermarket. The men then returned to the bar by the marina's entrance where they each drank a further glass of beer.

At 1803, the master assessed that the sea conditions had improved slightly, so he and the mate made their way to the tender in order to return to *GPS Battler*. The master was hungry and tired and he wanted to return on board before it became dark⁴. At 1805, the mate steered the tender out of the marina; the master was sitting towards the bow with the mate at the helm (**Figure 4**).



Figure 4: Still from CCTV at 1805 - tender leaving the marina

The transit across the inner harbour was relatively sheltered. As soon as the tender rounded the breakwater towards *GPS Battler*, it was heading directly into short, steep choppy seas. The mate reduced the tender's speed but this did not prevent sea water and spray coming over the gunnels and into the boat. The master moved aft to the seat amidships and the mate turned the tender so that it was no longer heading directly into the sea and wind. As a result, the quantity of water coming into the boat was reduced.

As the tender closed to within about 200m of *GPS Battler*, the mate again steered directly towards the workboat, into the choppy seas. Minutes later, when the tender was approximately 100m from *GPS Battler*, a wave broke over its bow. The master and mate immediately started to bail the water out, but a second wave soon broke over the tender's gunnels. The tender rapidly flooded and started to sink by its bow.

⁴ Sunset was at 2003

The master jumped into the sea but the mate's foot became caught by the tender's deck boards and he was momentarily dragged under the water. The mate freed himself but he was then briefly entangled in the 'A' frame at the tender's stern. The mate eventually surfaced and tried to release a life-ring attached to the tender's 'A' frame. He was unable to do so because the life-ring had been secured to the frame with a cable tie.

The mate saw the master swimming towards *GPS Battler* and soon caught up with him. The men talked to each other as they swam towards the workboat; the master joked about how difficult the situation would be to explain. After several minutes of swimming, the mate became tired and rolled onto his back to rest. The men started to drift apart and the mate lost sight of the master.

Meanwhile, the engineer ratings on board *GPS Battler* had seen the tender submerge and realised that the master and mate were in difficulty. The engineers quickly collected two lifejackets, a life-ring and line. One of the engineers climbed into the life-ring and he jumped into the sea with the two lifejackets. He then swam towards the master and the mate.

The engineer gave the mate the lifejackets. The mate managed to partially don one of the lifejackets and then started to look for the master. When he saw the master, he was face-down in the water and he was not moving. The mate swam to the master but he was unable to put the second lifejacket on him. He also tried to revive the master, but he did not respond.

The crew of a passing police patrol vessel had seen flotsam from the tender and, as the patrol vessel approached, they also saw the master, mate and engineer in the water. The policemen recovered the master and the mate onto the patrol vessel; the engineer was pulled back to the workboat by the second engineer on board using the line attached to the life-ring. The master was landed ashore and taken to hospital, but he was pronounced deceased at 2146.

3.1.3 Postmortem examination

The results of a postmortem examination of the master carried out in Spain concluded that he had drowned. There was no evidence of any contributing medical event or condition. Toxicology tests identified that the master's blood alcohol concentration was 1.01g/l.⁵

3.1.4 Environmental conditions

13 August 2014 was a clear, sunny day. The wind at sea outside the port was generally a gentle to moderate southerly breeze (Force 3 and 4 on the Beaufort scale with wind speeds between 7 and 16 knots)⁶. The sea was choppy with breaking wave crests. The sea temperature was 23°C.

⁵ 1.01g/l is equivalent to 101mg/100ml

⁶ The associated wave height is between 0.6m and 1m.

3.1.5 The crew

GPS Battler's crew comprised the master and the mate, both of whom were UK nationals, and two Filipino engineer ratings. All of the crew held International Convention on Standards of Training, Certification and Watchkeeping for seafarers (STCW) certificates in sea survival, first-aid, fire-fighting and personal and social responsibility.

The master, Paul Heritage, was 66 years old and held an STCW masters (tugs) II/3 limited to vessels under 500gt, which was issued in January 2003. Since going to sea in 1963 as a deckhand, he had gained a wealth of experience within the towing industry and first served as master in 1974. The master was employed by GPS Marine Contractors Ltd in 2003. He joined *GPS Battler* in March 2014 in The Netherlands.

In September 2013, the master passed a seafarers medical examination (ENG1) with no remarks or limitations. He was 1.78m tall and at the time of the medical he weighed 86kg. He was reported to be an able swimmer.

The mate was 38 years old and held a commercially endorsed RYA Yachtmaster offshore certificate, which was issued in 2013. The mate had joined GPS Marine Contractors Ltd in 2010. This was his first contract on board *GPS Battler*, which he had joined in Mahon on 27 July 2014. The mate was also an able swimmer.

The engineers joined *GPS Battler* on 6 June 2014 for their first contract with GPS Marine Contractors Ltd. They were not familiar with the use of the Very High Frequency (VHF) radio fitted in *GPS Battler's* wheelhouse. Both had mobile telephones but neither telephone was working.

At sea, the crew kept a 6 hour wheelhouse watch routine; the master stood the 6-12 watch and the mate stood the 12-6 watch. Each officer was accompanied on watch by an engineer. The wheelhouse watch routine was maintained while the vessel was at anchor off Almeria until the master and mate went ashore.

3.1.6 The tender

The Sweden registered dredger *Von Rocks* was owned and operated by Open Water Dredging AB. The tender was on board the dredger when it was purchased in August 2011 and was approximately 6m in length with a beam of approximately 1.5m. The tender's hull (**Figure 3, 4, 5 and 6**) was made of aluminium and was flat bottomed with a gunnel height of approximately 0.6m⁷.

Three seats were sited athwartships: one towards the bow, one midships and one towards the stern. An 'A' frame was located at the stern to which a lifebuoy was attached with cable ties. The tender was powered by a 20hp outboard motor; oars were also carried on board.

⁷ The tender's dimensions are only approximate and based on witness and photographic evidence. No documents relating to the boat's particulars or provenance were available.

The tender was used by the dredger's crew during dredging operations to transfer crew short distances to and from the shore, usually when the dredger was working within harbour limits (**Figures 5 and 6**). It was also used by the dredger's crew to access and maintain some of the dredger's deck equipment. *GPS Battler's* crew had not been authorised to use the tender.



Figure 5: Tender alongside *Von Rocks*

3.2 ANALYSIS

3.2.1 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.

3.2.2 The swamping

There is no evidence to suggest that *Von Rock's* tender was not fit for purpose for its intended role when operated close to the shore in sheltered waters. However, the tender's swamping off Almeria indicates that the sea conditions prevailing on this occasion exceeded the boat's safe operating limit.

CCTV footage indicates that the tender was not overloaded when it left the marina (**Figure 4**), but as the distance from the waterline to the top of the gunnels was only approximately 0.6m it was clearly vulnerable to swamping after it left the shelter of the inner harbour and headed directly into choppy seas. The master's change of position to the seat amidships and the adjustment to the tender's heading temporarily reduced the ingress of water, but this respite ended when the tender was turned back to head into the sea 200m from the workboat.



Figure 6: Tender during dredging operations

The subsequent water ingress following the tender's encounter with two successive waves overwhelmed the boat and caused it to semi-submerge. The crew had little alternative but to swim clear.

3.2.3 The trip ashore

GPS Battler's stop in Almeria was not scheduled and the vessel had sufficient provisions on board to complete the passage to Marin. However, the workboat had been at sea for 7 days and it is evident that the master saw the time at anchor as an opportunity to stock up with fresh provisions including, among other things, wine and cigarettes. He also saw it as an opportunity to have a meal ashore and one or two alcoholic drinks while looking around the town. There was no operational need for any of *GPS Battler's* crew to go ashore.

The boat trip into Almeria was not properly considered. *GPS Battler* was at anchor and the only means readily available to transfer from *GPS Battler* to Almeria was by using *Von Rocks'* tender. However, the workboat's crew were not authorised to use the tender and had no way of knowing its limitations. Moreover, from the outset neither the master nor the mate took into account that the return from the marina might be in rougher conditions. At best this would be uncomfortable but at worst it was potentially hazardous.

It is unclear why the master took the workboat's mobile phone ashore with him when he had his own personal phone. However, in doing so he denied himself the ability to contact the crew on board, and so was unable to check that the vessel was alright, or to pass the message that his return was delayed.

Furthermore, by leaving only the Filipino engineers on board, who were unable to use the VHF radio, the resulting anchor watch was contrary to best practice and the intent of the onboard SMS (see paragraph 2.1.3).

3.2.4 The decision to return

On the outward journey to the marina, the tender had not encountered any difficulties in the relatively calm conditions. It was only when the master and mate loaded the provisions onto the tender at 1627 that they recognised that the breeze had increased and waves had developed such that the return trip would be more difficult.

The master and mate had waited for about 1.5 hours in the bar by the marina before the master assessed that conditions had improved sufficiently for them to make the trip back to their vessel. However, the wind speed in Almeria had been relatively constant during the afternoon and, notwithstanding the possibility of local anomalies, any improvement or worsening of the wind and sea conditions was probably only marginal. The wind speed in open water was also higher than in the town.

Both the master and mate consumed alcohol while they were ashore in Almeria and toxicology tests showed that the master's blood-alcohol concentration was 1.01g/l (equivalent to 101mg/100ml). This was 2.5 times greater than the level allowed in *GPS Battler's* drug and alcohol policy (40mg/100ml) (see paragraph 2.1.3) and 25% higher than the UK drink-driving limit (80mg/100ml). As the mate had consumed an identical quantity of alcohol during the same period, his blood-alcohol concentration is likely to have been similar.

The effects of alcohol vary between individuals and include the impairment of motor co-ordination and increased confidence levels. In this case, there is no evidence from the CCTV footage available to indicate that the master was unsteady on his feet. However, given that he decided that to return to *GPS Battler* when the sea conditions had not improved substantially, his alcohol consumption probably contributed to him taking a more relaxed approach to risk, particularly as he was also hungry and wanted to return to the workboat before sunset.

3.2.5 Survivability

The postmortem examination showed that the master had drowned. He was reported to be a strong swimmer and it is evident that he had no difficulty in staying afloat and swimming towards *GPS Battler* for several minutes. However, although the master was medically fit and not overweight, the effort required to swim and to avoid swallowing seawater in the choppy seas would have been considerable. Although the sea was relatively warm, given the master's age, like the mate, he probably also tired. Without a lifejacket, which would have enabled him to keep his face clear of the water with very little physical exertion, his likelihood of survival was reduced significantly.

The master's dismissal of the mate's suggestion to take lifejackets in the tender was possibly influenced by the warm conditions and his swimming ability. He did not take into account the potential risks posed by the tender's low freeboard and the possibility of stronger onshore winds, which were a characteristic of the area during the afternoons. Given that the vessel's SMS required the crew to wear lifejackets when working on deck (see paragraph 2.1.3), it is unfortunate that the master did not adopt this principle when using the tender, where the risk of falling in the water was greater.

The securing of the life-ring carried on board the tender, with tie wraps, was poor practice that was not identified and rectified during the mate's examination. Consequently, the life-ring could not be used when it was needed. However, as the master had started to swim away from the tender almost as soon as it started to submerge, that the life-ring was not available probably did not contribute to the master's drowning.

3.2.6 Response

The response of the Filipino ratings on board *GPS Battler* when they saw the master and mate in the water was prompt and very positive. The mate had also started to feel tired and, although he was able to tread water, he too was in danger of succumbing to the effects of exhaustion and swallowing seawater. In the circumstances, that the mate was able to don the lifejacket provided by the Filipino engineer potentially saved his life.

SECTION 4 - ACCIDENT IN MARIN

4.1 FACTUAL INFORMATION

4.1.1 Background

Following the death of its master, Paul Heritage, in Almeria, Spain, *GPS Battler* proceeded to Marin in northern Spain to assist in a dredging operation. Two split hopper barges, which had been towed from the UK, were also used in this work. The involvement of *GPS Battler* and the barges in the dredging operation was completed in mid-December 2014. The workboat and the barges remained alongside in Marin over the Christmas period. GPS Marine Contractors Ltd, the workboat's operator, intended that *GPS Battler* would tow the barges back to the UK in January 2015.

GPS Battler's new master and bosun returned to the UK for the Christmas and New Year period, leaving the chief engineer and a deckhand/engineer on board. The master and the bosun were scheduled to re-join the workboat on 5 January 2015. Mark Stephens was also scheduled to arrive on 5 January 2015 to join the workboat, as the vessel's mate, for the return passage to the UK⁸.

4.1.2 Narrative

At 2110⁹ on 5 January 2015, the mate arrived at berth No.0 on the New Commercial Pier in Marin, Spain to join *GPS Battler*, which was moored outboard of two split hopper barges (**Figure 7**). The workboat's master and bosun were also scheduled to re-join the vessel on the same evening.



Figure 7: *GPS Battler* and barges moored alongside in Marin

⁸ Although Mark Stephens had not formally joined *GPS Battler*, he is hereafter referred to as the mate.

⁹ Times in this section are UTC (+1) unless stated otherwise.

The mate shouted towards the workboat to attract the attention of the crew on board because he was not comfortable trying to access the vessel without assistance. It was dark, he was carrying a bag weighing 18kg and, as it was close to low water, access to the deck of the inner barge required a 2m descent of a vertical ladder fixed to the quay wall (**Figure 8**). No one responded to the mate's shout, and he had no means of contacting the crew on board as he did not have the workboat's mobile telephone number.

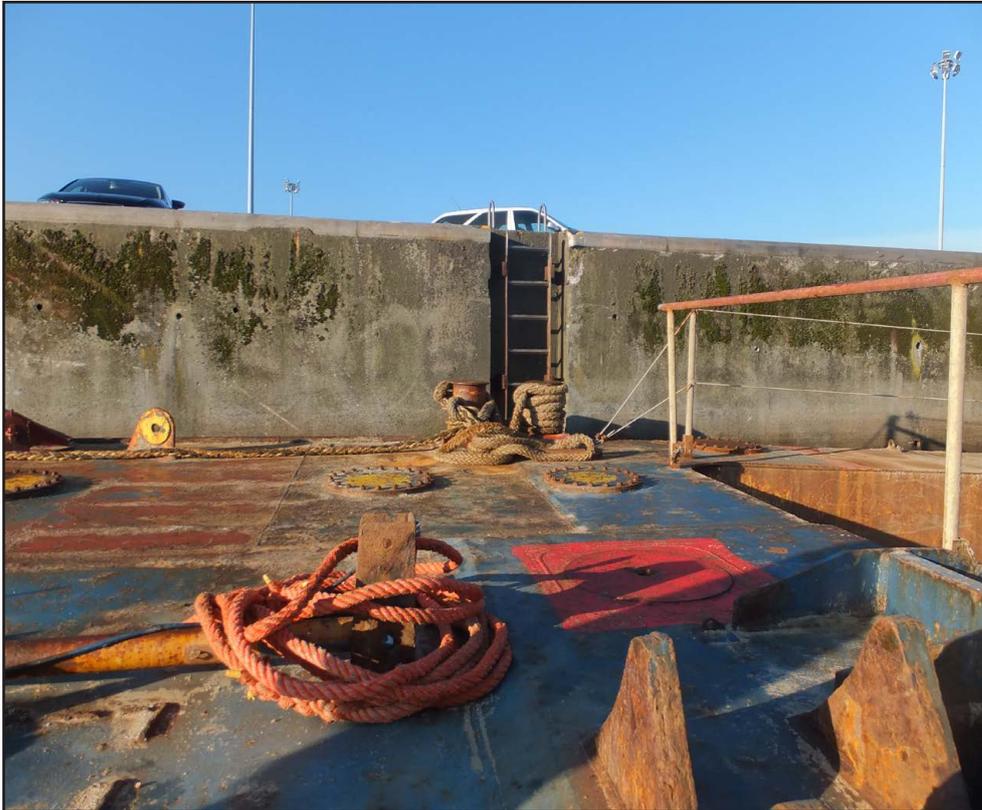


Figure 8: Vertical ladder on quay (near low water)

The mate then sent text messages to his wife and the workboat's master to advise them of the situation. He also called GPS Marine Contractors Ltd and stated that he was going to a hotel for the night. The master was travelling with the bosun and was still on his way to Marin. The mate walked to La Farola, a bar which was a short walk away outside the port. He arrived at the bar at about 2145 and was joined by the bosun about 1 hour later. The master also arrived at about 2330, having been on board *GPS Battler* to shower, change his clothes and eat.

While in the bar, it is reported that the mate drank approximately two bottles of red wine and several beers. The bosun drank one bottle and the master one or two glasses of red wine. The bosun ate tapas but the mate did not consume any food.

At approximately 0010 the master left the bar by taxi to stay at a friend's house for the night. About 40 minutes later, the mate also left. He entered the port through a pedestrian gate at 0058 and arrived at *GPS Battler's* berth at 0105. CCTV

recordings indicate that the mate was unsteady on his feet¹⁰. He did not attempt to board the workboat and remained standing beside a waste skip close to the quay edge (**Figure 9** and **10**).



Figure 9: Waste skip on the quayside

The bosun left La Farola at 0120 and arrived by the workboat at 0135 to find the mate leaning against the side of the waste skip nearest to the barges. The bosun spoke to the mate but he did not respond, so the bosun told him to stay where he was. By now, the tide had risen and the deck of the inner barge was only a few centimetres below the level of the quay, so the bosun pulled on the inner barge's head rope (**Figure 10**) until the barge was close enough to the jetty to step on board.

The bosun stepped onto the inner barge and then boarded *GPS Battler*. At approximately 0139, he entered the wheelhouse and started the bow thrust in order to keep the inner barge close to the quay wall to make it easier for the mate to step on board the inner barge. By now, the mate had moved between the skip and the quay edge (**Figure 11**). As the bosun engaged the bow thrust and thrust *GPS Battler*'s bow to starboard, he heard a noise that sounded like a splash. Initially, he thought nothing of it but he then realised that the mate was no longer on the quayside; his bag was still beside the skip.

The bosun left the wheelhouse and alerted the engineers inside the accommodation. By 0142, the bosun and the engineers had started searching the water for signs of the mate (**Figure 12**). A short while later the mate was sighted a few metres ahead of the inner barge below the skip; he was floating face-down and was not moving. The bosun and the engineers tried to recover the mate from the

¹⁰ The CCTV coverage in the port was taken from several cameras which automatically panned across different areas. Consequently, the coverage of particular areas, including the New Commercial Pier, was intermittent.



Figure 10: Still from CCTV at 0137 - bosun heaving in on headrope



Figure 11: Still from CCTV at 0139 - mate by quay edge



Figure 12: Still from CCTV at 0142 - crew searching for the mate

water using a rope, a boat hook and grapples. However, they were unable to catch hold of him due to the barge's freeboard, which was 3m above the waterline. A life-ring and line were available but were not used as the mate was unresponsive.

At 0147, the lines securing *GPS Battler* to the barges were let go and the bosun manoeuvred the workboat towards the mate. The workboat's freeboard was 1.7m and the bosun assessed that it would be easier to recover the mate onto its deck rather than onto either of the barges. However, the mate soon disappeared from sight and the bosun became concerned that he would be drawn into the workboat's propellers. At 0202, the bosun manoeuvred *GPS Battler* back alongside the barges, and at 0208 used the VHF radio to inform the coastguard of the situation and request assistance.

At 0224, the Spanish police arrived on site followed shortly after by a rigid inflatable boat (RIB) driven by the coastguard. The RIB's crew relocated the mate and, at 0238, he was lifted on board the RIB and taken to a nearby slipway. The RIB was met at the slipway by an ambulance. Paramedics attempted to resuscitate the mate but he was declared deceased at the scene.

4.1.3 Postmortem

Postmortem examination in Spain identified that the mate, Mark Stephens, had drowned. There was no evidence of a contributory medical event or notable external injuries included in the initial post-mortem examination report. The examination

identified that his stomach contained a large quantity of liquid that smelled of ethyl (alcohol); no solids were found. Toxicology tests identified that the mate's blood-alcohol concentration was 3.18g/l.¹¹

4.1.4 The deceased

Mark Stephens was 56 years old. He was an experienced seafarer who held a commercially endorsed offshore RYA Yachtmaster certificate qualification, and had worked for GPS Marine since July 2014.

Mark arranged his own travel to *GPS Battler*. On 5 January 2015, he left home in the UK at 0500 (UTC) and then took flights to London, UK and then to Porto, Portugal. He then travelled to Vigo, Portugal by bus and then took a taxi to Marin.

Mark was 1.74m tall and weighed approximately 97kg, his body mass index (BMI) was 32, which categorised him as obese. When Mark fell into the water he was wearing a waterproof jacket, a sweater, a T-shirt, jeans and training shoes. He was not a strong swimmer.

4.1.5 Other crew

The master was a British national and was 38 years old. He held a commercially endorsed offshore RYA Yachtmaster certificate, which was issued in 2013. He had been the mate on board *GPS Battler* when the workboat's then master had drowned on 13 August 2014 (see Section 3).

The bosun was also a British national and was 49 years old. He had 30 years' experience of working at sea and had undertaken the responsibilities of the workboat's mate during the dredging operations in Marin.

The chief engineer was Bulgarian and 61 years old. He held an STCW III/2 chief engineers' certificate. He had 40 years' experience at sea. The deckhand/engineer was Filipino and 46 years old. The chief engineer and the deckhand/engineer had remained on board over the Christmas period. Neither was aware that the mate was due to arrive on board on the evening of 5 January 2015.

4.1.6 Environment

At the time of the accident it was dark. The weather was clear and cold (approximately 7°C) with a light south-west breeze. The sea temperature was 13°C. The quayside was well lit by a number of floodlights (**Figure 9**). Low water on 5 January 2015 occurred at 2121 with a height of 0.7m; high water on 6 January 2015 occurred at 0332 with a height of 3.35m. The tidal stream was negligible.

4.1.7 The berth

GPS Battler had been moored outboard the two split hopper barges at No. 0 berth on the New Commercial Pier since 22 December 2014. The pier's concrete quay was unfenced, allowing open access to its edge (**Figures 7, 8 and 9**). The quay wall was fitted with a number of vertical ladders to provide access to vessels moored alongside.

¹¹ 3.18g/l is equivalent to 318mg/100ml

With the exception of the waste skip (**Figures 9, 10 and 11**), the quay in the vicinity of *GPS Battler* was generally clear of obstructions and trip hazards. The waste skip was approximately 2.5m ahead of the inner barge's bow and was perpendicular to the edge of the quay. The distance from the upper extremity of the skip to the edge of the quay was 0.7m.

4.1.8 Access

The means of access from the quay to the inner barge depended on the height of tide. The tidal range at spring tides was 3m. Around high water, the levels of the quay edge and the inner barge's deck were sufficiently close to enable a person to step up or down from the quay to the deck (**Figure 13**). Towards low water, the barge's deck was approximately 2.5m below the quay edge and so access was via a fixed vertical ladder fixed to the quay wall (**Figure 8**).

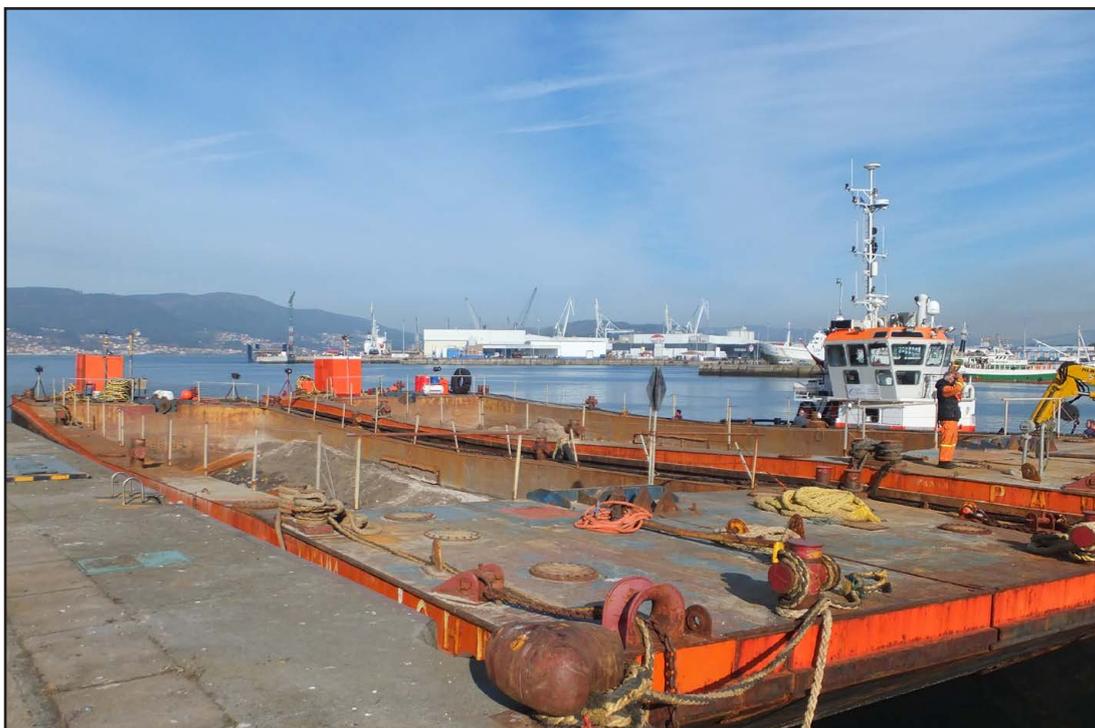


Figure 13: Quay and barges (near high water)

To avoid the frequent adjustment of the mooring lines during the rise and fall of the tide, the inner barge's mooring lines had been optimised for low water. As a result, the distance between the inner barge and the quayside varied between approximately 0.25m at low water and 2m at high water when the slack in the mooring lines allowed the barges to drift away from the quay. To keep the inner barge within stepping distance from the quay, it had become established practice to use *GPS Battler's* bow thrust to push the barges against the quay when persons were embarking or disembarking.

4.2 ANALYSIS

4.2.1 The fall

Nobody saw the mate fall from the quay into the water. However, CCTV recordings show that he moved in front of the skip (**Figures 10 and 11**) at about the same time as the bosun entered *GPS Battler's* wheelhouse. It is almost certain that he fell from this area as he was below the skip when he was first seen in the water. It is considered that the mate was not moving to step across onto the barge when he fell as he had not moved his bag.

It is not known why the mate moved to the front of the skip. The area was well lit and clear of trip hazards. However, as the distance from the leading edge of the skip to the edge of the quay was only 70cm, this was a relatively narrow space for someone of the mate's size to stand without getting very close to the quay edge.

4.2.2 Physical and mental state

The postmortem examination found nothing to suggest the mate fell due to a medical event. However, he had been travelling for over 15 hours when he started drinking, and he had consumed a large quantity of alcohol in *La Farola* over a period of 3 hours. At the time of the accident the mate was intoxicated, and probably very tired.

During the evening, it is reported that the mate had consumed approximately 24 units of alcohol¹², resulting in a blood-alcohol concentration of 318mg/100ml (see paragraph 4.1.3). The consumption of alcohol in such quantities over a short period is classed as "binge" drinking.

The mate's high blood-alcohol concentration, together with fatigue would have impaired his motor skills and co-ordination, and CCTV footage shows he was unsteady on his feet as he walked from the pedestrian gate towards *GPS Battler*. It is also likely that the alcohol he had consumed would also have caused a loss of understanding and slurred speech. Indeed, the mate's failure to respond when approached by the bosun as he leant against the skip probably indicates that he was in an alcohol-induced stupor. In such a state, it is almost certain that the mate fell into the water because he either stumbled or lost his balance.

4.2.3 Survivability

The sea water temperature was 13°C. Therefore, it is likely that when the mate fell into the water he suffered from cold water shock, which occurs when suddenly immersed in water temperatures of 15°C or below. Among other things, the cold can cause a gasp reflex, resulting in water being ingested involuntarily. Involuntary ingestion of water causes a spasm in the larynx, leading to the closure of the trachea (airway). Anoxia (lack of oxygen to the brain) quickly follows. As the person in the water then tries to inhale, water is drawn into the lungs and the spasm cycle repeats. In such circumstances it only takes between 20 seconds and 1 minute for a person to drown. Resuscitation must commence immediately to prevent death.

¹² One unit is 10ml of pure alcohol. It takes an average adult around an hour to process this so none is left in their bloodstream, although this varies from person to person.

In this case, the mate was already motionless and face-down in the water when he was first seen approximately between 2 and 3 minutes after falling in. He was not an able swimmer, was also obese and was intoxicated. Without a lifejacket to keep his head clear of the water, his chances of survival were extremely limited.

4.2.4 Response

When the mate was recovered from the water at 0238, he had been in the water for almost 1 hour. This was primarily because he was motionless and unresponsive, and was therefore unable to help himself in any way. Most methods of recovering persons onto vessels require the person in the water to help themselves to some degree. The mate was eventually recovered from the water by the coastguard RIB, which was highly manoeuvrable and, importantly, it had a low freeboard which enabled its crew to grab the mate and to pull him into the boat.

In view of the freeboard of the barges and *GPS Battler* and the limitations of the equipment available on board the workboat, the options available to the crew were very limited. It is therefore of concern that the bosun did not raise the alarm and request assistance until 0208. By then, the mate had already been in the water for approximately 28 minutes. It is not certain why the bosun did not raise the alarm sooner.

Although it is likely that the crew were focused on their efforts to rescue the mate and lost track of the time, it is also possible that the bosun's consumption of alcohol in *La Farola* adversely affected his decision-making and his actions to some degree. Nonetheless, as the mate was unresponsive from the outset, and as it took the coastguard RIB approximately 16 minutes to arrive on scene and a further 14 minutes to recover him from the water, the bosun's delay in raising the alarm is unlikely to have significantly affected the mate's chances of survival.

4.2.5 Safety management

GPS Marine Contractors Ltd had provided instructions and procedures on board its vessels. However, it is evident from the circumstances of Mark Stephens' death and the circumstances of Paul Heritage's death less than 5 months earlier (see Section 2) that these instructions were not always followed on board *GPS Battler*.

In particular, the deceaseds' and other crew members' consumption of alcohol, which was a causal factor in one drowning and possibly a contributory factor in the other, contravened the ship manager's drug and alcohol policy. Although the mate and the bosun were joining the vessel, both had worked on the vessel previously and should have been aware of the alcohol policy to be followed.

Notwithstanding that *GPS Battler* was operating outside the UK, the vessel's shore and onboard management were similar to other vessels operating in the workboat sector. However, the nature of workboat operations frequently requires crews to adapt and improvise. The crews also tend to be relatively close-knit and less hierarchical than elsewhere in the wider marine sector.

In such an environment, the development and implementation of effective safety management and safe systems of work is likely to be extremely challenging. For workboats operating abroad, it can only be achieved if, among other things, onboard instructions are relevant to the area of operation and ways and means are found to monitor crew compliance.

SECTION 5 - CONCLUSIONS

5.1 ACCIDENT IN ALMERIA

1. The open tender was usually used in sheltered waters and was not suitable for use in the choppy seas outside Almeria's breakwater. [3.2.2]
2. *GPS Battler's* crew were not authorised to use the tender and were unaware of its limitations. [3.2.3]
3. The trip to Almeria using the tender was not properly planned. The master was unable to communicate with the crew left on board, and an anchor watch was not maintained in accordance with the workboat's SMS. [3.2.3]
4. The master and mate's consumption of alcohol while ashore was contrary to the vessel's drug and alcohol policy. [3.2.4]
5. The master was over the UK drink-drive limit for alcohol, which probably contributed to him taking a more relaxed approach to risk when making his decision to return to *GPS Battler*. [3.2.4]
6. The master's likelihood of survival was reduced by not wearing a lifejacket. [3.2.5]
7. The actions of the crew on board the workboat were positive and timely. [3.2.6]

5.2 ACCIDENT IN MARIN

1. It is considered that the mate was not trying to board the vessel when he fell into the water. [4.2.1]
2. The mate was intoxicated and tired and probably either stumbled or lost his balance. [4.2.2]
3. The mate probably suffered from cold water shock when he entered the water. He was not a strong swimmer and he lost consciousness very quickly. [4.2.3]
4. The bosun's decision-making during the rescue attempt was probably influenced by his consumption of alcohol. [4.2.4]
5. The mate had been in the water for 28 minutes before external assistance was requested. However, this was unlikely to have significantly affected his chances of survival. [4.2.4]
6. The mate and the bosun's consumption of alcohol was contrary to the vessel's drug and alcohol policy. [4.2.5]

SECTION 6 - ACTION TAKEN

GPS Marine Contractors Ltd has:

- Revised its drug and alcohol policy to “zero tolerance”. The frequency of random testing has been increased and has been extended to include vessels operating outside of the UK.
- Reviewed its SMS and intends to add a section covering vessels being employed out of its principal operating area.
- Revised its emergency procedures, which now include the prioritisation of actions to be taken.
- Restructured the organisation of the marine and technical superintendents to enable the superintendents to be more involved with the running of its vessels.
- Appointed a compliance manager to review company policies and procedures.

SECTION 7 - RECOMMENDATIONS

GPS Marine Contractors Limited is recommended to:

- 2015/143** Closely monitor crews' compliance with its safety management system to ensure that the control actions it has already taken, particularly with regard to its stated 'zero tolerance' policy on the consumption of alcohol, have been effective.

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

