

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

“The sole objective of a safety investigation into an accident under these Regulations shall be the prevention of future accidents through the ascertainment of its causes and circumstances. It shall not be the purpose of such 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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SUMMARY

On 17 December 2011, an able bodied seaman (AB) fell approximately 25m into a partially open hold on the container vessel *Tempanos* while it was berthed in the port of Felixstowe. The AB, Jose Gonzalez, died of multiple injuries. There were no witnesses to the accident, but the available evidence indicated that he probably slipped on a patch of ice while walking across a hatch cover that was partially covering an open hold.

The investigation found that it was occasional practice for some crew members on *Tempanos* to walk across hatch covers above partly open holds.

MV *TEMPANOS*

Fatality from fall into cargo hold

Felixstowe

17 December 2011

Although there was clear guidance available regarding safe cargo operations on container ships, it was not always communicated to vessels calling at Felixstowe. *Tempanos*'s safety management system did not contain sufficient guidance or instructions to the crew about the hazards of walking on partially open hatch covers. A recommendation has been made to the ship's management company to review its safe working procedures. The container terminal's managers have also been recommended to conduct safety meetings with the crews of container vessels prior to commencing cargo work.



Photograph courtesy of FotoFile

FACTUAL INFORMATION

Narrative

At 2254 on 16 December 2011, *Tempanos* berthed port side alongside at Trinity container terminal berth number 5 in the port of Felixstowe. AB Jose Eduardo Ortega Gonzalez assisted with rigging the gangway before retiring for the night. Cargo operations started at 2330 and stevedores boarded the vessel to unlash the containers. The hatch cover at the extreme outboard (starboard) side of hold 3 was removed and placed on the quay. Five containers were then loaded into hold 3 on the outboard side (row 15). According to the loading plan, more containers were to be loaded into other rows in hold 3 and so the hatch cover was not replaced.

On 17 December at 0500 (0600 ship's time¹) AB Gonzalez started his 6 hour cargo watch. The third officer was in charge of a four-man watch, which comprised himself, two ordinary seamen (OS) and AB Gonzalez. One OS remained at the gangway while AB Gonzalez and the other OS kept watch on the cargo operations to check that the containers were loaded correctly and to record any accidental damage to the ship or cargo. The third officer remained in the ship's office. With unlashings complete, the last of the container terminal staff left *Tempanos* at 0550.

At 0642 AB Gonzalez called the third officer on his ultra high frequency radio to inform him that cargo work had commenced at bay 14 in hold number 2. At about 0645 the third officer went on deck and instructed the OS on cargo watch to go for breakfast and to take AB Gonzalez with him. The OS tried to contact AB Gonzalez on his radio, but received no response. Assuming that AB Gonzalez might have turned the volume down on his radio, the OS went for breakfast on his own. The third officer assumed that AB Gonzalez had joined the OS for breakfast.

At around 0700, the OS returned from his breakfast and met the third officer at the gangway. The two men asked each other where AB Gonzalez was. Realising that he might be missing, they started to search for him. At 0704, the OS saw AB Gonzalez lying at the bottom of cargo hold 3 in bay 18, row

9, approximately 5m aft of the forward bulkhead of the hold (**Figure 1**). The OS immediately alerted the third officer.

As the access door to the hold was locked, the OS ran to the accommodation to obtain the key from the bosun. He also informed the OS at the gangway about the accident, and they both shouted to a dock worker on the quay to call for an ambulance. The dockworker alerted the crane driver, who called the port's emergency ambulance team. Meanwhile the master, who had been informed by the third officer, contacted Harwich vessel traffic service who in turn informed the port's medical team.

By 0713, the crew had descended into the cargo hold. They found that AB Gonzalez did not have a pulse; his eyes were open and fixed. He was wearing an orange boiler suit, with a fleece and a black duffel coat on top, safety shoes and gloves. AB Gonzalez's safety helmet was found several metres away from his body and he was not wearing any fall prevention or fall arrest equipment. A copy of the cargo loading and discharge plan was found on the deck next to him.

By 0720 the personnel from the port's ambulance service had arrived at the scene, and after carrying out a check for any electrical activity in his heart, they declared that AB Gonzalez was dead at 0734. The postmortem examination report stated that death was caused by multiple injuries. Toxicological investigations found no traces of alcohol or recreational drugs.

Crew

The officers on board *Tempanos* were a mix of East European and Chilean nationals. The ratings were all Chileans, employed through Southern Shipmanagement based in Chile. All the crew had joined the vessel on 15 October 2011 during its construction at a shipyard in Korea. *Tempanos* was delivered by the shipyard to her owners on 3 November 2011. Many of the crew had sailed with each other on previous ships and most had worked on container ships in the past.

AB Gonzalez was 30 years old and had worked for Southern Shipmanagement for 11 years. He was qualified as a rating of a navigational watch

¹ All timings in the report are local (UTC). The clocks on *Tempanos* were kept at UTC+1



Figure 1: View of cargo hold 3 port side, looking aft

and held an STCW² II/4 certificate of competency. Reputed to be hardworking and conscientious, he was in line for promotion to the rank of bosun during his contract on *Tempanos*. He was well liked by his shipmates for his helpful nature and good leadership qualities.

Environmental condition and lighting

A record of environmental conditions on 17 December 2011 at the port of Felixstowe indicated that at 0600 and 0800 the ambient air temperature was +2°C. At 0600 the mean wind speed was 9.5 knots, and it had increased to 14 knots at 0800.

Around the time of the accident, it was reported that the forecastle deck was icy and slippery and that the access platforms leading to the crane driver's cab were also slippery due to ice. It could not be confirmed if there was ice on the hatch cover next to the opening above hold number

3. However, no rain was recorded in the area immediately after the accident and puddles of water were seen on the hatch covers above hold 3 later on in the day.

Sunrise on 17 December 2011 was at 0801. In addition to *Tempanos's* deck lighting, the shore cranes also illuminated the area directly beneath their booms.

Vessel and shore crane features

Tempanos had a total of 17 cargo holds and the distance from the top of the hatch coaming to the bottom of the hold was approximately 25m. The hatch covers for cargo hold 3, the location of the accident, were in four sections. The container storage locations were referred to as bays, which ran in the forward and aft direction of the ship. Within each hold, containers were stacked longitudinally and vertically with their locations identified by row, bay and tier. Two Twenty-foot Equivalent Unit (TEU) containers could be loaded in each section of a row, in the case of hold 3, the forward TEU would be in bay 17, and the after TEU in bay 19 (**Figures 2 and 3**). If a 40 foot container

² STCW: International Convention on Standards of Training, Certification and Watchkeeping for Seafarers



Figure 2: Hatch covers on hold 3 - looking forward and to starboard

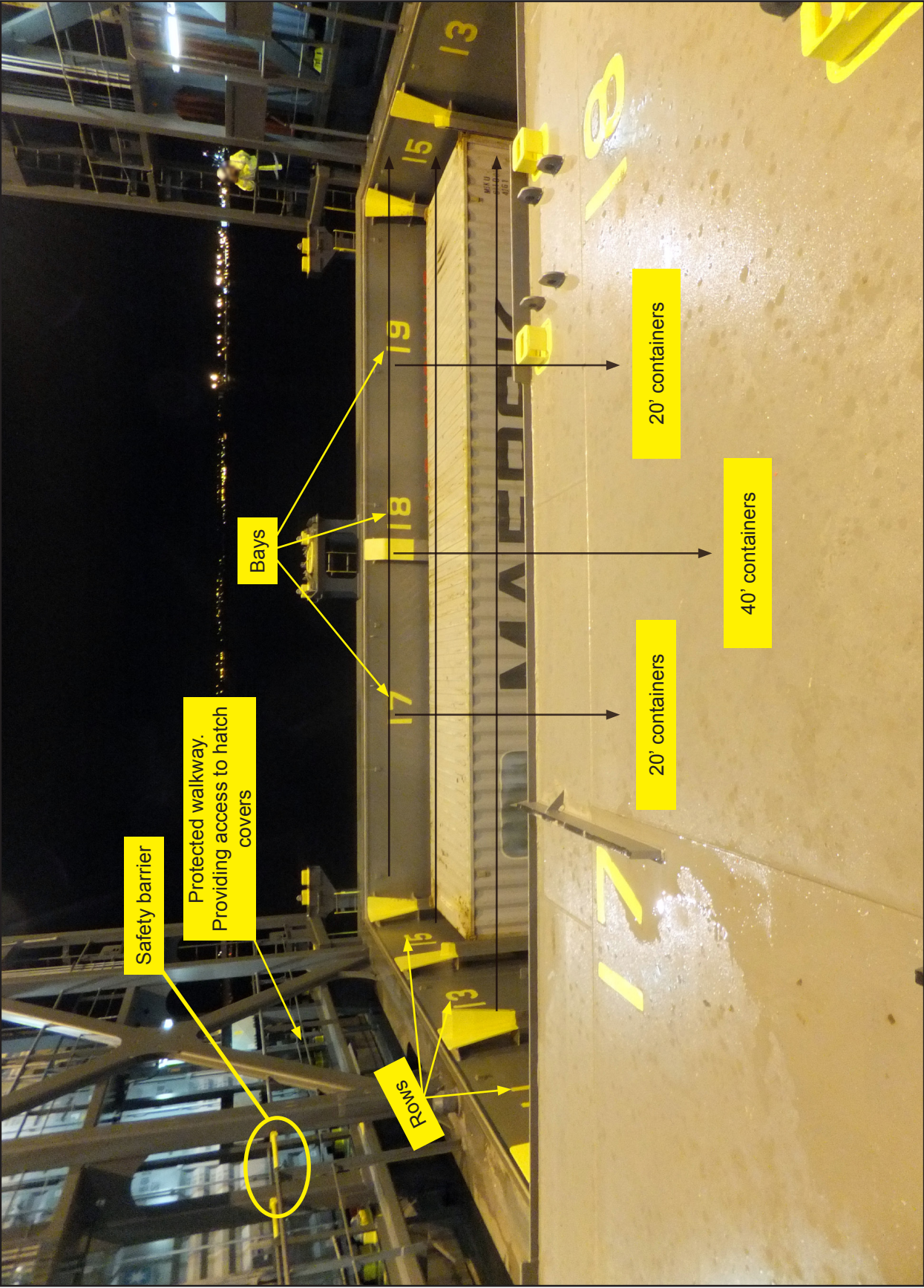


Figure 3: Container location terminology

was loaded instead of two TEUs, this was said to be loaded into bay 18. In hold 2, a 40 foot container could be loaded in bay 14, or TEUs into bays 13 and 15.

A protected walkway was provided between each cargo hold. This was accessed by climbing up a short ladder from the main deck. The guardrails on either side of the walkway were fitted with safety barriers, which could be lifted to gain access onto the hatch covers. The safety barriers on *Tempanos* were not self-closing, and could be left in the open position (**Figure 4**). Several safety barriers for accessing the hatch covers of hold 3, including one which led to the area where the hatch cover had been removed, were found in the open position immediately after the accident.

Shore workers were sometimes required to walk on the hatch covers to fit or remove container twistlocks, but instructions issued by the terminal operator required them to do this only when all the hatch covers were fitted to the hold. There was no requirement for *Tempanos*'s crew members to walk on hatch covers in Felixstowe to carry out their duties, but it was reported to be common practice on many vessels for some crew members to walk across the hatch covers instead of climbing back down to the main deck and going to the next protected walkway. On board *Tempanos* there were no temporary guardrails that could be fitted to the hatch covers, nor was there provision for security fall prevention tethers to allow personnel to work safely on hatch covers fitted to a partially open hold.

There were three shore cranes at berth 5 of Trinity terminal where the vessel was berthed at the time of the accident. Only one of the three cranes was capable of reaching the outboard side of *Tempanos*'s cargo holds due to the vessel's wide beam. Cargo operations were therefore planned so that this larger crane handled the containers on the outboard side of the vessel while the other, smaller cranes handled the remaining containers.

Guidance for container cargo operation

The International Cargo Handling Co-ordination Association (ICHCA) is a non-governmental organisation which has many aims, including reducing accidents in port work and protecting port workers' health. Hutchison Ports (UK), the company that owns the port of Felixstowe, is

an active member of ICHCA and members of its staff have made significant contributions to developing a series of publications '*designed to inform those involved in the cargo-handling field of various practical health and safety issues*'. (ICHCA International Safety Panel Briefing Pamphlet).

The ICHCA document '*Safe Working on Container Ships*' recommends that container terminal managers should draw up safety rules for all personnel working on board container ships and communicate the requirements for safe working practices in the container terminal to visiting ships' crews. The document also recommends that container terminal managers ensure that all those who are in close proximity to work areas should wear high visibility clothing, safety helmets and safety shoes. The document also states that '*No holds should be left open for dock operations longer than is required*'.

Another publication from the ICHCA, '*Container Terminal Safety*', states:

Safety rules should be applicable to ALL people entering container terminals including management, maintenance and engineering staff, marine services staff, Customs, Immigration, Port Health, ships' crews, shipping agents etc.

Ship's safety management system

Tempanos's safety management system (SMS) consisted of a generic manual for a number of different ship types and a specific operations manual for container ships. The SMS addressed the risks of falling into an open hold and working on deck under icy conditions, but the particular risks from walking on a partially open hatch cover were not considered. The risk mitigation strategy that was in place, required that openings through which a person might fall, should be fitted with secure guards or other protection. In the case of a partly opened hold, these control measures were achieved provided that personnel stayed on the main deck or the protected walkways between the holds. There was no requirement in the SMS for crew to wear high visibility jackets during cargo operations, and none were provided on board *Tempanos*.



Figure 4: Open barrier at walkway between hold 3 and hold 2

Terminal and ship interaction

When *Tempanos* arrived at Felixstowe on 16 December 2011, a cargo planner from the container terminal came on board and passed information about the plan for cargo operations to the chief officer. There was no discussion about what safe working practices the crew were expected to follow.

The cargo stevedores and charge hands were responsible for lashing and unlashings the containers, operating the semi automatic twistlocks, and ensuring that locating cones for containers were fitted as required.

Tempanos's deck watchkeepers carried copies of the cargo loading and discharge plans at Felixstowe. They monitored the cranes' movements primarily to verify that the cell guides inside the holds had not been damaged during the cargo operations. They also checked that containers loaded inside the holds were located correctly.

Between 0000 and 0600, a cargo supervisor went on board *Tempanos* to complain about a crew member who had been seen walking on the hatch cover of a partly-opened hold directly under a container as it was being lifted on board.

Container terminal staff reported that crew members on container ships calling at Felixstowe were occasionally seen walking around the unguarded perimeters of open holds, across hatch covers, and even on the hatch cover supporting beams above open holds.

ANALYSIS

The accident

Considering the injuries he sustained and the position in which he was found, there is little doubt that AB Gonzalez died from falling into the cargo hold. The last communication between AB Gonzalez and the third officer was at 0642, when he reported that cargo work had commenced at bay 14. When AB Gonzalez was called on the radio at around 0645, he did not answer. Therefore, it is likely that he fell between 0642 and 0645 even though his body was not discovered until 0704.

AB Gonzalez could have fallen from either the hatch cover adjacent to the open hold or through an opening in the walkway's guardrail where a safety barrier had been left open. As his body was found approximately 5m aft from the bulkhead which was directly beneath the walkway it was thought unlikely, although not impossible, that he could have moved this distance horizontally during the 25m fall. The more likely scenario is that AB Gonzalez was on the hatch cover immediately before the accident. As ice was reported on the forecastle and the shore crane access platform at around the time of the accident, and puddles of water were seen on the hatch lids later on in the day, it is also quite likely that the hatch cover's surface was slippery due to icy patches at that time.

Without any witnesses to the accident, it was not possible to establish what AB Gonzalez was doing on the hatch cover immediately prior to the fall. Reportedly conscientious in his duties, he could have been engaged in a number of activities, including: standing on the partly open hatch cover to observe the discharging of containers from bay 14; or looking into hold 3 to check for damage and that the containers had been loaded correctly. In these circumstances, it would have been quite possible for him to have slipped on a patch of ice and fallen over the edge of the hatch cover.

Safe working practices

Although access to the hatch covers was generally prevented by guardrails and safety barriers, it was reported to be common behaviour of some container ship crew members to walk on the hatch covers of partially open holds.

Although it is considered less likely that AB Gonzales fell through an open safety barrier in the guardrails protecting the walkways between the holds on *Tempanos*, several barriers (including the one that led to the open section of the hold at bay 18) were found open immediately after the accident. This was a serious breach of the instructions in the vessel's safety management system, which required the barriers to be kept closed whenever the hatches from the adjacent cargo hold were removed.

Walking on the hatch covers while the holds are fully covered does not present an inordinate hazard. However, when one or more covers are removed, the same activity is potentially very hazardous. The risks of falling into an open hold, especially when the hatch covers could be slippery from ice or water, must be assessed by the ship's managers and practical control measures introduced to prevent accidents.

After completing the loading of containers at the extreme outboard end of hold 3, the hatch covers were not replaced because of operational limitations. It is understandable that the cargo-handling requirements of newer ships with greater breadth might impose constraints on the way the cargo operation is conducted. However, it is essential that the implications of these constraints, such as the need to leave some hatch covers open for longer periods, are discussed by container terminal staff and ships' crews so that dangerous areas and unnecessary risks are avoided.

There was no requirement in *Tempanos*'s SMS for the crew to wear high visibility clothing, even though the guidance provided by the ICHCA recommends that it should be mandatory for everyone involved in cargo operations. A crew member who is in an unsafe position of work is more likely to be seen, and therefore appropriate action is more likely to be taken, if they are wearing high visibility clothing.

The incidence of the crew member who was reprimanded by the container terminal supervisor for placing himself directly under an incoming container while standing on a partially open hatch cover demonstrates that some of *Tempanos*'s crew members had not appreciated the risk they were exposing themselves to. The reported unsafe behaviour of crews working on decks of ships calling at Felixstowe indicates that the attitude to personal safety displayed by the crew of some container ships needs to be improved.

Ship shore interaction

Neither the container terminal nor ships' operators can take sole responsibility for the safety of cargo operations. The two parties have a shared interest in a safe and efficient cargo operation, and this can only be achieved by working closely together.

Although detailed guidance existed for shoreside personnel on the safe behaviour and the personal protective equipment that anyone involved in cargo work was expected to use, none of this information was conveyed to the crew on board *Tempanos*. Similarly, the SMS on board the vessel did not identify the risk of personnel walking on partially open hatch covers, and there was no procedure or equipment provided to do this safely. Without these controls, no-one should be permitted to walk on partially open hatch covers.

The disparity between the container terminal staff's understanding of safe working practices and that of the vessel's crew, illustrates the need for closer co-operation. It is accepted that the container trade relies on fast turnaround times, but achieving the necessary level of co-operation need not be an onerous burden. It was normal practice for container terminal staff to visit the vessel in order to discuss cargo work, and an additional discussion on safe working practices would not add significantly to the turnaround time. Such a discussion should focus on the behaviour expected of the crew and the demarcation of responsibilities.

Using the case on *Tempanos* as an example, a typical discussion might include the following topics:

- Establishing the requirement for high visibility clothing to be worn when on deck.
- Agreeing areas where crew should not enter during cargo operations.
- Demarcation of crew and stevedores' duties (eg. who fits twistlocks on hatch covers, and at what point should this be done in the cargo operation).
- Identifying the implications of operational constraints (eg. any hatch covers that might need to be left open longer than normal).
- Stating the consequences of deviation from agreed protocols of safe behaviour (eg. interrupting crane movements and delaying cargo operations).
- Any other local safety instructions.

A comprehensive package of good advice on safe working practices for container operations has been published by the ICHCA and other organisations. It would appear from the causes and circumstances of this accident that greater effort is needed, both from container vessel and terminal operators, to incorporate this advice into their routine working procedures.

CONCLUSIONS

- There is little doubt, from his injuries and the position in which he was found, that AB Gonzalez died from falling into the cargo hold, most likely at some time between 0642 and 0645.
- It is considered that AB Gonzalez fell from a hatch cover adjacent to the opening above hold 3.
- It is likely that there was ice on parts of the hatch covers above hold 3, making their surface slippery underfoot.
- Without any witnesses to the accident, it is not possible to establish what AB Gonzalez was doing prior to the fall. Reportedly conscientious in his duties, he could have been engaged in a number of activities to monitor the cargo operation. In these circumstances, it would have been quite possible for him to have slipped on a patch of ice and fallen over the edge of the hatch cover.
- It was reported to be common practice for some crew members to walk across holds where the hatch covers were partly open. *Tempanos's* SMS did not control this risk sufficiently well.
- There was no requirement in the vessel's SMS for the crew to wear high visibility clothing on deck during cargo operations despite industry guidance to the contrary.
- To improve safe working practices, a brief discussion should be held between the ship's crew and container terminal staff prior to the commencement of cargo operations, to: identify the potential risks; agree the control measures necessary to mitigate these risks; define the responsibilities and expected behaviour of both parties; and understand the consequences of deviation from agreed protocols of safe behaviour.
- Greater effort is needed, both from container vessel and terminal operators, to incorporate advice from the ICHCA and other organisations on safe working practices into their routine working procedures.

ACTION TAKEN

MAIB actions

The Chief Inspector of Marine Accidents has written to the International Cargo Handling Co-ordination Association asking that it re-emphasises the advice contained in the guidance notes to its members on the need to conduct a safety meeting between container terminal operators and the ships' crews prior to commencing cargo work.

The Chief Inspector of Marine Accidents has also written to both the International Cargo Handling Co-ordination Association and the International Chamber of Shipping requesting them to circulate this report among their members to raise awareness of the safety issues identified from this accident.

Actions taken by other organisations

Southern Shipmanagement Co. S.A. has:

- Issued instructions to its technical department to modify safety barriers in the guardrails protecting the walkways between the holds so that they close automatically.
- Introduced a requirement for all crew members to wear high visibility clothing and safety helmets if they go on deck during cargo operations.
- Started a safety campaign including additional training on board managed vessels and an increased number of visits, both by safety superintendents to vessels and crew to the company's main office, in order to improve awareness of safe working practices.
- Revised the company's 'Container Vessel Management Manual' to include the requirement for ships' crews to conduct safety meetings with container terminal personnel before starting cargo work.

Hutchison Ports (UK) has advised the master of *Tempanos* to modify the safety barriers in the guardrails on the walkways between the holds, so that they become self-closing.

RECOMMENDATIONS

Southern Shipmanagement Co. S.A. is recommended to:

2012/137 Improve the standard of occupational safety and protection for crew working on its vessels during container cargo operations by updating the risk assessments on all its managed vessels to ensure that the risk of walking close to partly open holds is identified, and control measures are put in place to prevent personnel from falling into the holds.

Hutchison Ports (UK) is recommended to:

2012/138 Ensure its container terminal staff conduct safety meetings with crews of visiting container vessels before the commencement of cargo operations.

SHIP PARTICULARS

Vessel's name	<i>mv Tempanos</i>
Flag	Liberia
Classification society	Germanischer Lloyd
IMO number	9447897
Type	Container vessel
Registered owner	Hull 1898 Co. Ltd (Monrovia, Liberia)
Manager(s)	Southern Shipmanagement Co. S.A., Valparaiso, Chile
Construction	Steel
Length overall	299.96m
Breadth moulded	45.6m
Gross tonnage	88586
Twenty Foot Equivalent Units (TEU)	8004

VOYAGE PARTICULARS

Port of departure	Bremerhaven, Germany
Port of arrival	Felixstowe, UK
Type of voyage	International
Cargo information	Containers

MARINE CASUALTY INFORMATION

Date and time	17 December 2011, between 0642 and 0704
Type of marine casualty or incident	Very Serious Marine Casualty
Location of incident	Felixstowe
Place on board	Cargo hold 3
Fatalities	1
Damage/environmental impact	None
Ship operation	Alongside
Voyage segment	Not applicable
External environment	+2°C with wind speed between 9.5 and 14 knots, no rain
Persons on board	24