

## IMCA Safety Flash 05/08

April 2008

These flashes summarise key safety matters and incidents, allowing wider dissemination of lessons learned from them. The information below has been provided in good faith by members and should be reviewed individually by recipients, who will determine its relevance to their own operations.

The effectiveness of the IMCA safety flash system depends on receiving reports from members in order to pass on information and avoid repeat incidents. Please consider adding the IMCA secretariat ([imca@imca-int.com](mailto:imca@imca-int.com)) to your internal distribution list for safety alerts and/or manually submitting information on specific incidents you consider may be relevant. All information will be anonymised or sanitised, as appropriate.

A number of other organisations issue safety flashes and similar documents which may be of interest to IMCA members. Where these are particularly relevant, these may be summarised or highlighted here. Links to known relevant websites are provided at [www.imca-int.com/links](http://www.imca-int.com/links). Additional links should be submitted to [webmaster@imca-int.com](mailto:webmaster@imca-int.com)

### 1 Movement of Vessel During Crane Operations Caused Near-Miss

A member has reported a near-miss involving two persons working at height, which was caused by a shifting in position of the vessel due to movement of the vessel crane. During a vessel mobilisation, two personnel were required to conduct work at height on some of the vessel's antennae. Access to the antennae was gained using a man-riding basket attached to a shore-side crane. The personnel were raised by the crane from the quay and positioned at the worksite to commence the work.

During the work on the antennae there was an independent request to move the onboard vessel crane to conduct a lift as part of the mobilisation. As the onboard crane moved overboard it caused the vessel to heel, which in turn caused the work area where the two personnel were located to suddenly move away from the man-riding basket. This may have given the impression to the two personnel that the man-riding basket was moving.

Immediately the bridge was contacted by the operations supervisor who in turn contacted the crane operator to order an all-stop on the vessel crane movements. No personnel were injured during this incident.

The incident illustrates the need for good communications between all departments and personnel, particularly during simultaneous operations. Whilst the two operations did not appear to conflict, they had an effect on one another. Improved communication links should be established between shore crane and operations control via the bridge to prevent further incidents.

Members are advised that part two of the IMCA guidance on operational communications, covering lifting operations, is currently being prepared for publication and will be available next month as IMCA SEL 020/M 193.

### 2 Report on the Loss of the Bourbon Dolphin

IMCA has been alerted to the publication of the report of the Norwegian commission on the loss of the Bourbon Dolphin. The full report is available at the following web address, with a summary report attached.

<http://www.regjeringen.no/en/dep/jd/Press-Center/pressemeldinger/2008/report-on-the-loss-of-the-bourbon-dolphi.html?id=505100>

# 1. Summary

In this Summary the Commission provides a brief account of the accident itself and a summary reproduction of key conclusions of the report. For the record, the Commission would note that such certain nuances will be missing in such a summary.

## 1.1 The Accident

The “Bourbon Dolphin” was delivered to the company, Bourbon Offshore Norway, at the beginning of October 2006 by the shipyard Ulstein Group in Ulsteinvik, Møre og Romsdal county. The vessel was designated DP2 Anchor Handling Tug Supply Vessel, built and equipped to perform anchor handling, towing and supply operations in deep water. She had a gross tonnage of 2,974 tonnes, was 75.2 metres long and 17 metres wide. The vessel had a continuous bollard pull of 180 tonnes and a tension on the main winch of 400 tonnes. The vessel was put into operation immediately; up to the accident, she had completed 16 assignments.

From the end of March 2007 the “Bourbon Dolphin” was on contract to the oil company Chevron. The contract concerned anchor-handling in connection with the move of the drilling rig “Transocean Rather” on the Rosebank oilfield, west of Shetland.

The ocean depth in the area concerned is 1,100 metres. The rig is moored with eight anchors. The distance between the rig and the mooring positions was around 3,000 metres. The mooring lines were about 3,500 metres, of which about 900 metres was of 84 mm chain and about 920 metres of 76 mm chain, plus 1,725 metres of 96 mm wire. Deployment of anchors was done by means of the vessel running out the rig’s chain, connecting it to chain that the vessel had on board, whereupon the rig ran out wire. The anchor that was fastened to the vessel’s chain was thereafter lowered down to the seabed with the aid of the vessel’s winch and wire. During the last part of the deployment, another vessel participated by grabbing hold of (grappling) the chain so as to distribute the weight of the mooring and relieve the strain on the rig.

Around 09:00 on Friday 12 April 2007 the “Bourbon Dolphin” began to run out chain for the last anchor (no. 2). Around 14:45 all the chain was out. The “Bourbon Dolphin” then drifted considerably off the mooring line and asked the rig for assistance. The “Highland Valour” was sent to assist the “Bourbon Dolphin”, but did not succeed in securing the chain. The “Bourbon Dolphin” drifted eastwards towards the mooring of anchor no. 3. The rig instructed the vessels to proceed westwards, away from anchor no. 3. During an attempt to manoeuvre the vessel towards the west, at the same time as the chain’s point of attack over the stern roller shifted from the inner starboard towing-pin to the outer port towing-pin, the vessel developed a serious list to port. The engines on the starboard side stopped. The vessel at first righted herself, but soon listed again and at 17:08 rolled over on her port side.

The capsizing happened suddenly and without much warning. Of those on the bridge, only one of the first officers managed to get out. The crew members who had been in the deck area managed to get hold of life-jackets, climb onto the vessel’s side and jump into the sea before she rolled right over. Two persons who had been in the mess got themselves out onto deck and into the sea.

Full alarm was immediately sounded on the rig and the vessels in the area were at once set to searching for survivors. Helicopters from the British coastguard were alerted and arrived on the spot after about an hour. Other vessels in the vicinity also proceeded to the casualty.

The “Bourbon Dolphin” had a crew of 14 persons. Also on board was the master’s 14-year-old son. Seven persons were saved. The bodies of three persons were found in the sea, the remaining five persons are still missing.

The casualty remained some days afloat, bottom-up, until she sank on Sunday 15 April. The “Bourbon Dolphin” has subsequently been located on the seabed, where she is lying in an almost upright position.

## **1.2 The structure of the report**

Most chapters contain partial and main conclusions related to the matters under discussion. The summary ought therefore to be read in conjunction with the main presentation.

Chapter 2 describes the establishment and appointment of the Commission, its qualifications and terms of reference, the work of the Commission of Inquiry, including the implementation of open hearings and the collection of evidence, the use of expert witnesses, the addressing of the adversarial principle and requirements as to public access to documents.

Chapter 3 presents regulatory requirements for anchor-handling vessels and anchor-handling operations. By way of introduction, the international regulations and Norwegian legislation on maritime safety are explained. Thereafter follows a review of the requirements for the vessels’ design and equipment, safety management system, manning and qualifications. Next are reviewed the requirements for control, inspection and certification. An explanation is given of the British regulatory system for anchor-handling operations and of the guidelines for this that the industry organisations have adopted for the North-West European Area. Finally, operational standards for the performance of marine operations and regulatory requirements related to the mooring system for the rig are reviewed.

Chapter 4 provides a description of the company, Bourbon Offshore Norway. The chapter also discusses the crews during the operation, the company’s safety management system, certification and audits.

Chapter 5 gives a factual description of the vessel “Bourbon Dolphin”. Design, construction process and commissioning, the vessel’s tank arrangement, engines, anchor-handling equipment and winch system with emergency release function are reviewed relatively thoroughly. The chapter also discusses the vessel’s stability book and load calculator. Rescue equipment and navigation equipment are additionally dealt with. In conclusion, the vessel’s operating history is described.

Chapter 6 reviews the rig move that the “Bourbon Dolphin” was helping to perform. By way of introduction the Commission will describe the players on the commissioning side – the oil company, the rig company and the consultancy firm, specifications for the rig and an overview of personnel on the rig during the operation. A relatively thorough review of the planning of the rig move is also made – the choice of mooring system and installation method,

requirements for the vessels, weather criteria and risk assessments and plans for alternative situations (contingency planning).

Chapter 7 presents key data for the vessels that were selected by the operator for the rig move.

Chapter 8 provides a review of the rig move up to the capsizing, including the crew change on the “Bourbon Dolphin”.

Chapter 9 presents the incidents that on 12 April 2007 ended with the capsizing of the “Bourbon Dolphin”. First comes an explanation of the running-out of the diagonal anchor (no. 6); then a presentation of the attempt to assist made by another vessel. Then an account of the actual accident is given, including for the external forces that affected the vessel in the decisive phase.

Chapter 10 provides, by way of introduction, an account of the crew’s evacuation. This is followed by a chronological presentation of the rescue operation’s individual phases and implementation, including available resources and use of various rescue aids. The chapter also deals with the roles played by Norwegian authorities and the company during the rescue operation.

Chapter 11 describes the measures taken in an attempt to salvage the casualty. By way of introduction the Commission provides a list of observation of the casualty’s positions. There follows a presentation of occurrences until the signing of the salvage contract, of the bodies involved and the decisions taken along the way.

In Chapter 12 the Commission undertakes summarising analyses and considers the direct and indirect causal relationships and the report’s approach to questions of responsibility.

In Chapter 13 the Commission makes its recommendations.

### **1.3 Key conclusions**

A selection of key conclusions of the report is here presented. The order does not say anything about their importance in relation to the accident and the Commission’s terms of reference.

Key conclusions are:

- The vessel was built and equipped as an all-round vessel AHSV (Anchor Handling Supply Vessel). Uniting these functions poses special challenges. In addition to bollard pull, anchor-handling demands thruster capacity, powerful winches, big drums and equipment for handling chain. Supply and cargo operations demand the biggest possible, and also flexible, cargo capacities both on deck and in tanks. The “Bourbon Dolphin” was a relatively small and compact vessel, in which all these requirements were to be united.
- The company had no previous experience with the A 102 design and ought therefore to have undertaken more critical assessments of the vessel’s characteristics, equipment and not least operational limitations, both during her construction and during her subsequent operations under various conditions. The company did not pick up on the

fact that the vessel had experienced an unexpected stability-critical incident about two months after delivery.

- The vessel's stability-related challenges were not clearly communicated from shipyard to company and onwards to those who were to operate the vessel.
- Under given load conditions the vessel did not have sufficient stability to handle lateral forces. The winch's pulling-power was over-dimensioned in relation to what the vessel could in reality withstand as regards stability.
- The anchor-handling conditions prepared by the shipyard were not realistic. Nor did the Norwegian Maritime Directorate's regulatory system make any requirement that these be approved.
- The ISM Code demands procedures for the key operations that the vessel is to perform, Despite the fact that anchor-handling was the vessel's main function, there was no vessel-specific anchor-handling procedure for the "Bourbon Dolphin".
- The company did not follow the ISM code's requirement that all risk be identified.
- The company did not make sufficient requirements for the crew's qualifications for demanding operations. The crew's lack of experience was not compensated for by the addition of experienced personnel.
- The master was given 1½ hours to familiarise himself with the crew and vessel and the ongoing operation. In its safety management system the company has a requirement that new crews shall be familiarised with (inducted into) the vessel before they can take up their duties on board. In practice the master familiarises himself by overlapping with another master who knows the vessel, before he himself is given the command.
- Neither the company nor the operator ensured that sufficient time was made available for hand-over in the crew change.
- The vessel was marketed with continuous bollard pull of 180 tonnes. During an anchor-handling operation, in practice thrusters are always used for manoeuvring and dynamic positioning. The real bollard pull is then materially reduced. The company did not itself investigate whether the vessel was suited to the operation, but left this to the master.
- The company did not see to the acquisition of information about the content and scope of the assignment the "Bourbon Dolphin" was set to carry out. The company did not itself do any review of the Rig Move Procedure (RMP) with a view to risk exposure for crew and vessel. The company was thus not in a position to offer guidance.
- The Norwegian classification society Det norske Veritas (DNV) and the Norwegian Maritime Directorate were unable to detect the failures in the company's systems through their audits.

- In specifying the vessel, the operator did not take account of the fact that the real bollard pull would be materially reduced through use of thrusters. In practice the “Bourbon Dolphin” was unsuited to dealing with the great forces to which she was exposed.
- The mooring system and the deployment method chosen were demanding to handle and vulnerable in relation to environmental forces.
- Planning of the RMP was incomplete. The procedure lacked fundamental and concrete risk assessments. Weather criteria were not defined and the forces were calculated for better weather conditions than they chose to operate in. Defined safety barriers were lacking. It was left to the discretion of the rig and the vessels whether operations should start or be suspended.
- In advance of the operation no start-up meeting with all involved parties was held. The vessels did not receive sufficient information about what could be expected of them, and the master misunderstood the vessel’s role.
- The procedure demanded the use of two vessels that had to operate at close quarters in different phases during the recovery and deployment of anchors. The increased risk exposure of the vessels was not reflected in the procedure.
- The procedure lacked provisions for alternative measures (contingency planning), for example in uncontrollable drifting from the run-out line. Nor were there guidelines for when and in what way such alternative measures should be implemented and what if any risk these would involve.
- The deployment of anchor no. 2 was commenced without the considerable drifting during the deployment of the diagonal anchor no. 6 had been evaluated.
- Human error on the part of the rig and the vessels during the performance of the operation.
- Communication and coordination between the rig and the vessel was defective during the last phase of the operation.
- Lack of involvement on the part of the rig when the “Bourbon Dolphin” drifted.
- The roll reduction tank was most probably in use at the time of the accident.
- The inner starboard towing pin had been depressed and the chain was lying against the outer starboard towing pin. The chain thereby acquired a changed angle of attack.