Bourbon Dolphin Tragedy – No Scope for Complacency

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Introduction

- April 2007 - anchor handling vessel Bourbon Dolphin capsized and sank in the UKCS with the loss of 8 lives.
- “The Bourbon Dolphin was a brand-new vessel, built at a recognised shipyard with modern technical solutions, certified and approved by Norwegian authorities, regulation-manned with certified personnel and operated together with other vessels under a known procedure …” – Norwegian Royal Commission.
- The aim today is to look at some of the relevant factors, safety learnings and to underline the point that there must never be any room for complacency in safety.
Background

- What happened?
- April 2007: semi-submersible rig Transocean Rather being moved between locations in the Rosebank Field, West of Shetland.
- Rig had been towed to new location.
- 7 of the 8 anchors had already been laid.
- 12 April 2007 - Bourbon Dolphin (BD) was preparing to lay the last anchor when it capsized and sank.
- 8 killed, 7 survivors.
- Remains greatest loss of life in a maritime incident in the UKCS since Piper Alpha.
Vessel Build

- This was a new vessel – delivered to Bourbon Ships AS (owner) and Bourbon Offshore Norway AS (manager) in October 2006 – 6 months before capsize.
- Designed as an anchor handling tug support (AHTS) vessel by Ulstein, Norway – A102 design.
- Only vessel ever built with this design.
- Built by Ulstein Verft at Alesund, Norway.
- Small for an anchor handler:
  - Overall length 75.2 metres;
  - Beam 17.0 metres.
- 400 tonnes main winch.
Vessel Build (cont’d)

• Significant changes made during construction:
  – Especially adding a much heavier winch package on the third deck.

• Building work certificated by Norwegian Maritime Directorate and DNV.


• July 2006 – launched.

• 20 August 2006 – inclining test performed and approved by NMD.
Vessel Build (cont’d)

- 2 October 2006 – NMD approved stability book. 21 loading conditions but only 4 for anchor handling (AH).
- 3 October 2006 – vessel completed sea trials and delivered to owners.
- At time, Regulations such that stability only needed to be assessed by authorities as a supply/tow vessel – not as an anchor handler.
Potential Stability Issues for BD in Anchor Handling

• Stability manual:
  – If during AH wire/chain > 0.5 metres from centre line work winch tension restricted from 400 tonnes to 300 tonnes maximum – but sharks’ jaws 1.75 metres from centre line therefore in effect winch downgraded to 300 tonnes for AH;
  – In AH roll stabilisation tanks must not be used.

• Loading conditions for AH proceeded on basis of no more than 70 tonnes of fuel being used between departure from and arrival back in port – need to return to port every 3 or 4 days. Impractical for anchor handling?
Potential Stability Issues for BD in Anchor Handling (cont’d)

- Turning test during sea trials – listed to 17.2 degrees.
- December 2006 – while holding a rig off Mongstad, Norway, along with 3 other AHTSs listed to port between 5 and 7 degrees.
- Both back-to-back Masters felt that vessel was less stable than would have expected and insisted on sailing with greater bunkers.
- At launch discovered that vessel was 392 tonnes heavier than expected – increase of 13.9%.
- Should the above have been seen as warning signs that something possibly amiss?
Work at Rosebank

• Chevron as operator wanted 3 appraisal wells to be drilled.
• Very deep water – 1,100 metres.
Rig Move Planning

• Significant planning over 2 years – including Mooring Analyses.
• Chevron contracted Transocean Rather to do work.
• Detailed rig move procedures (“RMP”) in place – jointly by the marine and technical consultancy Trident, Chevron and Transocean.
• First appraisal well completed (“G”).
• Vessel to be moved to new location (“I”) – 2 nautical miles.
Rig Move

• RMP required minimum bollard pull of 180 tonnes.
• BD’s certificate of bollard pull showed 180 tonnes.
• But, when using thrusters effective bollard pull down to as low as 125 tonnes.
• Bourbon marketed vessel as having work winch capacity of 400 tonnes – despite AH limitation to 300 tonnes, as above.
• Trident’s view was that anchor handlers would need up to 400 tonnes winch capacity for the job – but not specifically stated in RMP.
Rig Move (cont’d)

- Chevron contracted anchor handlers:
  - Olympic Hercules;
  - Vidar Viking;
  - Highland Valour;
  - Bourbon Dolphin.

- BD smallest of 4:
  - 16 previous jobs;
  - 9 were AH;
  - All in much shallower water.
Day of Tragedy – 12 April 2007

• 6 anchors already laid.
• Olympic Hercules laid second last anchor (number 6):
  – Had difficulty staying on line – up to 761 metres off line at one point when 1,700 metres (44% offline) from rig;
  – Master felt that current stronger than normal that day.
• BD was running last anchor (number 2) – opposite to number 6.
• Found it difficult to stay on the intended track – moving East towards number 3 anchor chain.
• Concern that might trawl over number 3 chain.
• Trying to get to drop point
• Anchor on port side of deck.
Day of Tragedy (cont’d)

- 1500 – 1626 - Highland Valour assisted BD by grappling chain.
- 1626 - Close quarters situation between BD and Highland Valour – unseen by towmaster on rig’s bridge and not reported to rig.
- Listing 5 degrees to port – transfer of ballast from port to starboard tanks.
- Towing between starboard pins.
- Outer port pin up and inner port pin down.
Day of Tragedy (cont’d)

- BD temporarily lost engine power.
- 1647 – 1,019 metres off line at 1,400 metres (73% offline) from rig.
- Temporary electrical blackout.
- Engines overheating – high pressure water gun used to cool engines.
- 1709 - Master lowered inner starboard pin causing chain to move rapidly to inside of outer port pin – 2.7 metres.
- This significantly altered angle of attack of chain on vessel – to between 40 and 60 degrees.
- Seconds later vessel capsized.
Emergency Response

- Major emergency response.
- Other vessels in vicinity.
- Rescue helicopters.
- 7 survivors picked up from sea.
- 3 bodies recovered from sea.
- BD floating in capsized state – still attached to rig by anchor chain.
- Rig down-manned to emergency personnel only.
- SOSREP involved – risk of pollution and to give greatest opportunity for salvage.
What Happened Next?

- Risk of weather and current changing and BD striking rig.
- Hull slowly sinking.
- 2 days later with permission of SOSREP anchor chain cut.
- Vessel sank next day – 15 April.
- 5 bodies never recovered – including 14 year old boy.
Official Inquiries

• Maritime Inquiry at Sunnmore District Court, Norway, on 25 April 2007.
• Norwegian Royal Commission established
  – Took evidence in Oslo on various occasions between June 2007 and December 2007;
  – Issued its report on 28 March 2008;
  – www.regjeringen.no.
What Caused The Capsize?

• Major issues with vessel’s stability – from design onwards.
• Insufficient thought given to effect of adding larger winch and greater weight.
• BD’s bollard pull sufficient for this work?
• On the day, no-one stopped the job when BD was so far off line.
• BD’s emergency release function did not operate as quickly (12 metres per second) as crew anticipated – they understood it was a quick release.
What Caused The Capsize? (cont’d)

- Marginal environmental conditions.
- Roll reduction tanks being used.
- Depressing inner starboard pin caused angle of attack of chain to between 40 and 60 degrees.
- Stability had to be extremely carefully monitored during AH.
- Master new to vessel and crew – only 1½ hours handover during the night 13 days before sinking. Only 6 months sea time as Master.
- Was BD ever sufficiently stable for AH?
Lessons Learned And Changes Made

• NWEA Guidelines revised.
• Start-up meeting – in port and on location.
• Bollard pull certificates.
• Traffic lights system
  – Green – less than 150 metres offline
  – Amber – 150-300 metres offline
  – Red – more than 300 metres offline.
Lessons Learned And Changes Made (cont’d)

• Emphasis on ability to “stop the job”.
• Standardising of data provided to prospective charterers.
• Greater emphasis on sea, wind and current limits in RMP.
• Current meter.
• Separate roles of Towmaster and Marine Rep.
• Improved emergency release mechanisms.
• Emphasis on overall risk rather than separate risks to rig and individual vessels.
Lessons Learned And Changes Made (cont’d)

- Improved communications between and amongst rig and vessels.
- Emphasis on anchor handling instructions to Master – not just left to Master to find information in 500+ page Stability Manual.
- Simulator training.
- Training in use of load calculator.
- Specific AH procedures for each vessel.
- Need for Regulator to consider and approve loading conditions for anchor handling.

- Could this happen again?
Questions