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.

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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.

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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.

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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.
- 31 May 2006 – yard issued preliminary stability manual.
- July 2006 – launched.
- 20 August 2006 – inclining test performed and approved by NMD.

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Vessel Build (cont'd)

- 28 August 2006 – final stability manual issued.
- 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?

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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?

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Work at Rosebank

- Chevron as operator wanted 3 appraisal wells to be drilled.
- Very deep water – 1,100 metres.

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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.

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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.

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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.

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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.

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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.

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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.

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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.

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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.

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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.

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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?

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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.

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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.

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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?

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Questions

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