NOPSEMA briefing
and
MODU mooring systems
in cyclonic conditions

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• Triennial independent review of NOPSEMA
  – Stakeholder engagement continues to be a focus
• Legislative change
  – [Amended Wells Regulations](#) commence 1 Jan 2016
• NOPSEMA focused topic inspection program
Maintenance management

- management of deferral of work
- equipment strategies - inspection and monitoring
- structural integrity - inspection and monitoring
- safety-critical equipment meeting performance standards.
Contractor management

- Contractor agreements and performance governance by the operator in relation to:
  - how the operator of a diving project effectively ensures diving contractors are complying with their DSMS/DPP
  - third party contractors & equipment management
  - asset integrity monitoring programs conducted by third parties.
- Contractor selection and competency
- Operator and contractor interface management e.g. SIMOPS.
Blowout source control contingency planning

• Currently the degree of contingency planning for a well blowout (relief well, cap and contain etc) varies between titleholders. NOPSEMA will inspect titleholders arrangements for compliance with the legislation.
  – Note: new well regulation RMAR Part 5, Reg. 5.09(k) now specifically addresses the matter.
Position keeping systems

- Stability management including Ballast & Bilge Systems.
- Dynamic positioning systems
- Pre-lay mooring design
- Inspection testing and maintenance including software updates
- Integrity of safety critical elements
- Competence (operators and maintainers of position keeping systems).
MODU mooring systems in cyclonic conditions
• The *Atwood Osprey* experienced a mooring failure during cyclone Olwyn and was blown some three nautical miles off location in the vicinity of subsea and surface infrastructure and environmentally sensitive shorelines.

• Investigations have been conducted by NOPSEMA and Atwood who have both committed to sharing lessons learned from this incident with industry.
Sequence of events - Cyclone Olwyn

- **9 March** – Commence well suspension in preparation for rig evacuation
- **10-11 March** – Osprey completes well suspension, power- down and evacuation
- **12 March** – TC Olwyn strikes Atwood Osprey
- **12-13 March** – AHTSV reports rig off location ~3nm
  13-man team arrives on board to take the rig in tow by the AHTSV and holds station; team departs rig
- **14 March** - Commence ROV operations to assess seabed and condition of infrastructure.
Four known Incidents of MODU loss of position due to Cyclone activity

- Mar 2004 – MODU dragged anchors, Cat-3
- Dec 2008 – MODU dragged anchors, Cat -2
- Feb 2011 – MODU dragged anchors, Cat -3
- Mar 2015 – MODU snapped anchor wire, Cat -3
Regulatory perspective

Six documented instances where MODUs have failed to down-man in the face of impending cyclones.

- Semi-Sub MODU 2004
- Jack-Up MODU 2006
- Semi-Sub MODU 2007
- Semi-Sub MODU 2009
- Semi-Sub MODU 2011
- Semi-Sub MODU 2015
Inconsistency in safety case design and performance standards utilised in mooring design and analysis.

- “50 year return period” - 1 case
- “API RP 2SK using 20 year return period” - 2 cases
- “API RP 2SK using 10 year return period” - 1 case
- “specification to ABS rules and MODU code” - 1 case
- completely silent on design and performance standards for mooring systems. - 3 cases
Investigation overview

• Hind-cast computer modelling
• ROV survey of the seabed
• Review of the mooring system design and its component parts
• Inspection of critical components
• Visual inspection, metallurgical analysis and destruction testing of the mooring lines
• Design including pre-laid systems
• Assurance, installation and managing change
• Inspection and maintenance.
Findings - Mooring design

• Return period (20,50,100 year RP environmental conditions)

• Component positioning

• Lack of detailed risk assessment at the mooring design stage involving all parties

• Deficiencies in the assurance processes at the interfaces between the responsible parties.
Mooring installation - Interface

Combination of rig and pre-laid mooring components
• Pre lay mooring installation procedures
• Drag anchor pull test tensions
• Management of change.
• Records of inspection history
• Frequency of inspections
• Competency assurance system for mooring equipment/rope inspectors
• Lack of performance standards and the necessary associated assurance tasks for the mooring system – ongoing availability and reliability of the SCE
Opportunities for improvement

• Procedures for managing mooring line tensions for survival conditions/MODU cyclone evacuation
• MODU real time position indication - GPS
• Mooring line tension/weather recording and UPS
• MODU recovery – preparedness for towing
Key learnings - Mooring failure

- Reliability of the mooring system under foreseeable cyclone conditions
- Assurance of mooring design, installation and critical component materials – quality control
- The interface: SCE - inspection, maintenance, MoC and operations procedures
- Recovery preparedness and response
Regulatory approach and expectations
Provided an opportunity for industry and NOPSEMA to collectively examine better ways to manage this significant risk.

- Provide information about the incident and lessons learned
- Communicate regulatory requirements and perspective
- Discuss opportunities for improvement
  - identify any actions on which immediate consensus can be reached
  - identify areas for which there is consensus in direction but require more work to define detail.
Workshop inputs

• NOPSEMA and Atwood investigation findings
• Information paper provided for context
• Consideration of existing standards and practices from elsewhere
Regulatory expectations

To strengthen requirements with a view to improving the situation:

• Achieve consensus on what is best practice in relation to each of these issues;
• Determine current industry knowledge and approach with respect to mooring design criteria;
• Assess and manage the risks arising from these issues with respect to the impending cyclone season and longer term.
Safety case considerations:

- rig operators - mooring systems are safety critical

Current considerations:

- understand the design basis and integrity of current hardware
Next steps

NOPSEMA will issue regulatory guidance:

• to address key issues identified and recognized in the workshop and in the information paper;
• to raise awareness and prompt a review of arrangements in place for the immediately forthcoming cyclone season; and
• to provide guidance on key interface points between titleholders and operators which should be addressed in the rig safety case

Methodology for topics requiring further work
Thankyou