IMCA Guidelines
Lifting & Rigging Seminar

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IMCA’S FOCUS

• IMCA is a trade association in the offshore marine construction industries.
• IMCA represents the vast majority of marine contractors and the associated supply chain in the world with around 900 members in 65 countries.
• Our mission is to “Improve performance in the marine contracting industry.”
• IMCA’s technical portfolio has evolved over the last 20 years.
KEY LRMC GUIDANCE

• IMCA LR001, M194 – Guidance on Wire Rope Integrity Management

• LR004, M 197, SEL 023 – Guidance on non-destructive examination (NDE) by means of magnetic rope testing

• LR 006, M 187, SEL 019 - Guidelines for lifting operations Rev.1

• IMCA LR008, M179 – Guidance on the Manufacture and Safe Use of Cable-laid Slings & Grommets

• LR 009, M 237 Rev.0.1 - Guidance on The Selection, Safe Use and Inspection of High Performance Fibre Slings
IMCA LR 004/SEL 023/M 197 Rev.1 - Guidance on Examination of Steel Wire Rope through Magnetic Rope Testing (MRT)

• Just completed the revision of this guidance in September 2018.

• Guidance includes the following:
  − Principles of Operations – How MRT works
  − Parameters – Sensitivity and speed limits and speed variability
  − Verification and Calibration – Verification & calibration of LF and LMA
  − Manufacturers Operating Guidelines
  − Competence & Training – Level 1, 2 & 3 operators
  − Interpretation of Data – Carried out by a level 2 operator minimum
  − MRT Trace Reports
  − Rejection Criteria
  − Recording and Retention of Records
Guidance new additions are as follows:

- Lift Planning Flowchart
- Lift Categorisation Flowchart
- Defining lift categories
- Crane charts
- Tag lines
- Out of plane forces
- Vessel stability
- Heave compensation – Passive, Active, Combined, Constant tension
- Appendices
  - Subsea Lifts
  - Diving operations
  - Lifting personnel
  - Lifting at extreme heights
  - Lifts when dismantling
LR 006, M 187, SEL 019 - Guidelines for lifting operations

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CRANE CHARTS (CRANE CURVES)

• Load radius curves (crane curves) are graphical display(s) of the safe working load relative to the crane radius.

• Due to the complexity and variation of use of the crane there may be many sets of crane curves to present the full crane capacity in an understandable form.

• Unfortunately, there is no standard format for presenting this information and all crane manufacturers have developed their own methods of displaying this critical information.

• The basic crane curve is a diagram and/or table showing the permissible crane safe working load relative to the possible range of hook radii.
  
  − This is normally plotted as a curve which generally shows that the crane lifting capacity decreases as the hook radius increases.

• However, knuckle boom cranes do not follow this model.
• The shaded areas represent maximum lift capacity in relation to the rope exit point on the knuckle jib.

• Note that at a radius of 7.0m the maximum lift capacity varies from a maximum of 50t to only 3t due to the load acting on different parts of the boom and knuckle jib.
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• Even in calm seas there will always be some (small) unsolicited movement of a suspended object. Lifting operations carried out in ‘marginal’ weather conditions can easily lead to situations where objects begin swinging out of control as they are lifted from the deck.

• This swing induces component stresses on the lifting appliance that are not often considered. There can be side-loading of the crane jib. ‘Side-loading’ means a load applied at an angle to the vertical plane of the jib. ‘Off-loading’ may also occur.

OUT OF PLANE FORCES
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• Moving loads can affect the vessel’s motion, trim, heel and stability.
• Depends on the weight of the load in relation to the size of the vessel.
• Height and position of the crane boom rope exit point in relation to the centre of gravity of the vessel. This can be noteworthy even for relatively small loads, increasing in significance for heavy lift operations.
• Sudden accidental loss of hook load due to failure of the lifting equipment should be considered at the most unfavourable point at which the hook load may be applied to the vessel, i.e. that which induces the largest heeling moment. Such a loss will cause the ship to immediately roll away from the side of the lift.
• Reference should be made to the amendments to Part B of the 2008 Intact Stability Code section 2.9.5 – Sudden loss of hook load.
VESSEL STABILITY

Total weight = W

CG

W

W_L
Is it smoko yet?
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Additional Considerations for Subsea Lifts

- Shock Loading and its Avoidance
- Vessel Set-Up Locations and the Initial Positioning of Lifted Objects
- Subsea
- Pre-Lift, Lift-Off from Deck and Overboarding
- Lifting Through the Splash Zone
- Stop Points during Lowering Through the Water Column
- Retrieval of a Subsea Object
- Security of the Rigging Arrangements Attachment to the Lifted Object During Subsea Lifting
- Safety Considerations
- Recovery of Lifting Arrangements to Surface
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APPENDICES – DIVING OPERATIONS

- Lifts in Support of Diving Operations
- Safe Location of the Diver(s) During Subsea Lifting Operations
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IMCA’s Latest Lifting Publication

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Lifting at extreme heights is to be defined in this appendix as "the installation of a lifted object at a height above the deck, which requires additional care and attention over normal slinging and rigging arrangements."

**Potential Issues to consider**

- **Wind** – speed and direction – Change at different heights
- **Dynamics** – Load behaviour due to natural frequencies
- **Special Lifting Tools and Guide Systems** - Mitigating measures for cases where a special lifting tool or guide system fails to operate properly
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WORKING TOGETHER:
Getting back to business – oil companies and contractors finding new ways of working

The seminar’s focus is on the industry finding new strategies and ways of working in today’s challenging and changing market environment. In addition, technical sessions on Marine and Diving will explore key technical and operational issues facing the industry today.

28 – 29 November
World Forum
The Hague
The Netherlands

www.imca-int.com
THANK YOU

- Please continue to use IMCA’s guidance
- Every guidance document has a feedback button – please use
- Allows IMCA Technical Advisers to collate feedback for future revisions.
Improving performance in the marine contracting industry