Challenges Operating & Maintaining Offshore/Subsea Cranes

Phil Watson
TechnipFMC Crane and Hydraulic Superintendent & Technical Authority
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Technology In Cranes Today

TechnipFMC is a world leader in Project Management, Engineering and Construction for the energy industry. As such we need to stay up to date with the latest crane technology and systems in our new offshore cranes to allow us to remain competitive in today’s very challenging market.

Main challenges are as follows:

• Ensuring any new technology provides benefit to the end client, project and value for money.
• Maintaining safety and operational performance with the seismic change in crane functional/operational systems
• Striving to be more environmentally friendly
• Full reliance on OEM Engineering, Testing, Installation & Commissioning
Ensuring Any New Technology Provides Benefit To The End Client, Project And Value For Money

• Of course this means we have to keep looking for the latest crane designs and system upgrades for existing equipment also. What works for one vessel certainly doesn’t mean it will work for another as it very much depends if it is a dive, construction or pipelay vessel.

• Fibre rope technology
• Remote crane operation
• Power storage & regeneration
• New modes (Splash zone etc.)
• Virtual reality
Maintaining Safety And Operational Performance

As crane systems evolve, there is a emergent requirement to develop operational built in load simulation modes. These would be accessible to crane operators, to allow systems to function in the same manner as when an actual load is on the crane.

The benefits of this are:

• Verifying the crane will behave as expected before the actual load is deployed.
• Providing the right training, familiarisation, operating experience & competence for the operator

This would help ensure safety and operational performance with regards crane operations utilising new modes such as:

• Engineered lift
• Launch mode
• Splash zone mode
• Extreme off lead mode
• Established system operator training e.g. active heave compensation and active constant tension would also benefit
Striving To Be More Environmentally Friendly

With increasing awareness of environmental issues, there has been rising demand for environmental-friendly business practices. Considerations/challenges on this subject regards offshore cranes are as follows:

- All Electric cranes
- Harnessing regenerative power during AHC / lowering of hook
- Use of EAL (Environmentally Acceptable Lubricants), challenges here are that the lubricants are biodegradable with water and the impact that water ingress could have and also compatibility with older systems
- Low power modes
Full Reliance on OEM Engineering, Testing, Installation & Commissioning

When new equipment or upgrades are to be delivered we as end users are fully reliant on the OEM from the concept phase, through Engineering, development and bench-testing right up to installation and commissioning on our asset.

The main challenges relating to this are as follows:

• All too often we find OEM arriving onboard to install upgrades which haven’t been proven onshore and feel they can use our cranes as a testbed to see if it actually works or not. That said, I appreciate systems have to be commissioned on the equipment it is installed too, however testing should have been completed first onshore.

• The impact to an operational vessel schedule and subsequent knock on effect to projects can be massive if it doesn’t work right first time.
Maintenance & Reliability - Challenges

Maintenance in a modern offshore crane has a variety of challenges due to:

- Complexity
  - Additional modes
  - Complex PLC systems/software – Again reliance on OEM
- Size of the equipment
  - increasing due to demand from end clients that want to deploy ever larger subsea equipment
- Quantity of individual components
- Crane working loads
- Radius
- Working depths

All of which puts a huge reliance on the maintenance team both on and offshore to ensure the equipment is functioning correctly. This isn’t easy or realistically achievable due to the complexity of some systems which may require specific loads, at specific depths in the right conditions to engage.
Maintenance & Reliability - Opportunities

Aside from the challenges there are also opportunities with regards modern cranes and technologies:

• Commonality of components used throughout the crane is of a huge benefit to us as end users as obviously it means we can reduce our spares holding on the vessel and within the fleet whilst also maintaining a sensible budget.

• OEM’s could possibly utilise technology more within today’s systems to self-fault find without the need for OEM’s to attend the vessel or utilise remote access systems which have their limitations such as:
  • Can take a lot of time to arrange
  • Security required around these systems has its own challenges also, due to hacking etc

• Maintenance training, experience and competence of our personnel is vital to us as end users to ensure reliability and fault finding when things go wrong. Added benefit here is the vessel crew become more familiar with the eqpt also.

• Again potential huge benefits if load operational simulation systems are within the actual crane, to verify the crane will behave as expected.
Cost of non Quality

Quality control is always an issue and with industry demanding right first time, the main challenges and considerations are as follows:

• It constantly proves to be a real challenge in agreeing with our suppliers the level of QC that is required. There needs to be a change in approach industry-wide as at the end of the day the end user is paying for it, or indeed the lack of it.

• Inconsistencies in that the critical areas verified by Class is at the discretion of the attending Surveyor witnessing the inspection or test.

• Whilst class society have their own requirements to fulfil when 3.2 certification is requested, the specific needs of the end customer are not shared or included and can lead to issues onsite. Bearing in mind if the part is not required right away and is put in storage, it could be a year, or a lot more before any issue is found and any applicable warranty expired.

• During vendor audits we find a disappointing lack of quality control displayed by some companies to this critical area which can have a major impact to the end user.
Cost of non Quality - Example

An example of this is we place an order with OEM for a component:

• OEM instructs third party to manufacture with 3.2 certification
• Component is delivered with 3.2 certification, however the certificate doesn’t state exactly what was verified so we are unable to carry out any meaningful QC.
• Anomalies are found after installation/during testing
• Root cause is found to be a discrepancy regards tolerances not considered a critical dimension to surveyor
• Impact to supplier negligible
• Impact to end user massive

Manufacturers must be more open and discuss with us regards exactly which dimensions etc require checking to ensure the correct information is passed to the surveyor to allow verification.
Thank you for listening and any questions?