Modulift: Working Between the Hook and the Load

Our Vision
To be renowned globally as specialist engineers operating in a niche market, concentrating on the provision of custom and complex lifting solutions and exceeding our customers expectations by providing an all round service on the delivery of value for money and quality products.

Our Mission
To globally deliver our expertise through innovative designs of quality products and customer satisfaction whilst ensuring a safe lifting environment.

Our Values
- Leadership: Driving the standard of lifting products higher
- Passion: Committed to delivering high quality products and ensuring safety comes first
- Innovation: Inspiring engineering genius
- Quality: We do what we do well

At Modulift, we pride ourselves on being able to offer you a complete lifting engineering service from start to finish. We are here to help you solve your lifting problems, advise on rig planning, design custom lifting equipment, or manufacture quality assured products to the highest specifications.

Engineering Consultancy

With over 20 years experience, Modulift’s team of Design Engineers are able to provide expert advice for all your lifting requirements. Whether you require a custom designed and engineered lifting solution, complex rig design, lifting products with high QA or a solution for a super heavy lift, Modulift is available every step of the way.

Engineered Products
Because not every load fits into a standard mould, our engineering team are lifting industry experts who will work with you and your team, to custom design and build the ideal solution for your lifting requirements. With innovative thinking, we can develop the right equipment to meet your needs whether they be height, environment, weight, flexibility of use, speed of assembly, or transportation requirements to name but a few – we can design a custom solution for you.

Enhanced QA
Modulift recognise that high levels of QA are often required for the Oil & Gas, Offshore and Renewable Energy industries. In response to these high standards Modulift offer enhanced QA options to the standard off-the-shelf range of spreader beams, as well as custom engineered products. See more on page 6.

Super Heavy Lifting Equipment
Modulift regularly design and build spreader beams up to 1650t and beyond. As the lifting industry drives demand for larger capacity beams Modulift has recently upgraded the in-house compression test rig by adding an additional 50% capacity. The test rig is now one of the largest rigs of this type within the UK and can now accommodate testing of spreader beams up to 28m. For lifting equipment over this capacity, Modulift can offer alternative methods of testing or a variety of analytical reports to suit your requirements.

Rig Design
When dealing with customers who require lifts that involve more complex rigs and combinations of Modulift Spreader Beams or where the item being lifted does not have a central centre of gravity, our customers can call on our assistance. We will make available our engineering team who will assist by designing the most appropriate solution using the Modulift range of products.

Services Available
- Engineering Design
- Engineering Drafting
- Lifting Consultancy
- Rig Planning Services
- Enhanced QA Options
- Super Heavy Lifting Equipment

Why Use Modulift?
- All our equipment conforms to the highest engineering standards and meets or exceeds government and industry regulations such as AS 4991 - 2004 and BS13155, and Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)
- Modulift have ISO 9001:2015, 14001:2015 & 18001:2007 and are members of LEEA
- Using a specialist engineering company gives you peace of mind for a safe lift with engineers on hand to ensure everything runs smoothly
- We can design a solution specifically designed for your needs minimising potential problems associated with using incorrect equipment
- Reduced costs associated with: over engineering; excessive design times, individual fabrication requirements, testing and liability insurance; and damaged loads
Modulift provide a record first lifting solution for the Wind Energy Industry and Harland and Wolff

Modulift have designed and manufactured the giant lifting rig used for the fast and efficient lifting and assembly of the Repower’s 5MW giant wind turbines at Harland and Wolff in N. Ireland. Responsible for the unloading and assembly of the clean power generators for Vattenfall’s Ormonde Offshore Wind Farm Project in the Irish Sea, Harland and Wolff also have to load them back onto the barges when assembled, for installation in the Irish Sea, creating a need for a rig that could multi-task.

Modulift’s remit was to design a rig which could not only lift the individual turbines and towers separately and assembled, but also lift three wind turbine blades in one go enabling the blades to stay in their calibrated sets for each turbine, at all times. Using the same principles of their existing standard products, Modulift succeeded in engineering a safe, lightweight, and cost-effective solution allowing Harland and Wolff to continuously store and load from January until the end of July.

To provide a solution which achieved the objectives required, Modulift designed a rig consisting of two elements which could be used in various combinations for the transportation and installation process of the various wind turbine components. The first is a giant 500 tonne lifting beam, 16 metres long. Due to the nature of the lift and the need for minimizing the overall weight of the rig itself, Modulift had to be able to design and build the beam to weigh less than 40 tonnes without compromising its capabilities. The lifting beam was also designed to include inspection hatches and was built to ensure that these hatches would not compromise the strength of the beam. The beam was an exciting milestone for Modulift, proving their technical achievements in designing highly engineered lifting equipment to provide the ultimate solution for lifts of this size.

The second was another feat of engineering for Modulift in the design and fabrication of a 48.5m spreader that weighed no more than 9.6 tonnes to maximise the capacity of the cranes. The beam had to be easy to assemble in situ and capable of lifting the wind turbine blades, which in their set of three weigh 75 tonnes and span 61.5 metres.

"We are proud to be able to say that we designed and manufactured this solution for Harland and Wolff. We spent a lot of time planning the best solution for their requirements and still needed to be able to turn this project around in record time. With the barges already on their way from Germany we had to battle against the weather to get the components milled and transported to Belfast on time to enable the project to stay on schedule, with the first barge arriving in early January. The components were taken by ferry to Belfast on several trucks and with Belfast experiencing its coldest winter in 16 years, snow storms threatened to delay delivery. Luckily the dedication of all parties involved enabled both the Lifting Beam and the Lattice Spreader to be delivered before Christmas, and tested and commissioned in time for its first use in early January", said Sue Caples, Operations Director and Head of Engineering at Modulift.

As demand for heavy lifting is set to increase, with Modulift receiving a record number of orders for its MOD 400 so far in 2011, Harland and Wolff are expecting to use their new 500 tonne lifting beam on many projects to come. In addition, Modulift are now standardizing their new "giant" Lattice Spreaders for future customers looking to lift very long loads up to 100 tonnes, keeping the same passion, accountability, and quality of their existing products.
# Enhanced QA Options

Available for our standard spreader beams and all engineered products where required, you can choose some or all of the options shown below.

<table>
<thead>
<tr>
<th>Product Specification</th>
<th>Off-the-shelf</th>
<th>Enhanced QA Options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Materials</strong></td>
<td>Impact tested to -20° C/-4°F in accordance with BS EN10025/10210/10219</td>
<td>Impact tested to -40° C/-40°F in accordance with BS EN 10025/10225/API SL</td>
</tr>
<tr>
<td><strong>Welding</strong></td>
<td>BS EN ISO 15614.1</td>
<td></td>
</tr>
<tr>
<td><strong>Paint Finish</strong></td>
<td>Standard Finish - Yellow RAL 1003 2 Pack epoxy paint system</td>
<td>High build systems suitable for marine environments</td>
</tr>
<tr>
<td><strong>Markings</strong></td>
<td>Engraved stainless steel ID plate</td>
<td>iD plate and additional labelling</td>
</tr>
<tr>
<td><strong>Testing</strong></td>
<td>–</td>
<td>Proof Load Testing &amp; NDT</td>
</tr>
<tr>
<td><strong>Bolts</strong></td>
<td>Grade 8.8 HT zinc plated</td>
<td>Low temperature, galvanised</td>
</tr>
<tr>
<td><strong>Shackles</strong></td>
<td>Rated to -20° C/-4°F</td>
<td>Rated to -40° C/-40°F</td>
</tr>
<tr>
<td><strong>Slings</strong></td>
<td>Rated to -40° C/-40°F and BS EN 13414-1 &amp; -3 compliant</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Verification</th>
<th>Off-the-shelf</th>
<th>Enhanced QA Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNV Type Approval</td>
<td>✔ ✔</td>
<td></td>
</tr>
<tr>
<td>DNV Design Approval</td>
<td>✔ ✔</td>
<td></td>
</tr>
<tr>
<td>Original Design Verification Proof Load Test</td>
<td>✔ ✔</td>
<td></td>
</tr>
<tr>
<td>Job specific Proof Load Testing &amp; NDT on individual beams</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Third Party Verification of individual beams</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Certification / Documentation</th>
<th>Off-the-shelf</th>
<th>Enhanced QA Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC Declaration of Conformity</td>
<td>✔ ✔</td>
<td></td>
</tr>
<tr>
<td>User Instructions</td>
<td>✔ ✔</td>
<td></td>
</tr>
<tr>
<td>Material Certification</td>
<td>✔ ✔</td>
<td></td>
</tr>
<tr>
<td>Inspection and Test Plan (ITP)</td>
<td>✔ ✔</td>
<td></td>
</tr>
<tr>
<td>Welding, NDT &amp; Proof Load Testing documentation</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>MRB (Manufactures Record Book)</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

---

## Enhanced QA Case Study

### Modulift Lift for Exxon Mobil’s Busiest Offshore Rig

Modulift designed and manufactured two 550t WLL Spreader Beams for the Offshore Transportation & Installation of Pre Assembled Units onto Floating Production, Storage, and Offloading vessels

- Designed and built to the exacting QA requirements typically required for offshore projects
- Rig remained operational throughout the lift and installation
- Spreader Beams fulfilled all relevant design factors such as dynamic amplification and skew factors together with taking into account any additional factors required by the offshore design code

In recent years the number of projects requiring complex lifting solutions involving specialist QA requirements for the Oil & Gas industry as well as the Nuclear, Petroleum and Wind Energy industries has seen a vast increase around the world. Modulift has reacted to this by developing a specialist department to manage these projects from design to delivery.

One such example of these types of project was for Exxon Mobil. In late 2010 Modulift UK Ltd was awarded a contract to design, manufacture and supply two 550t WLL capacity Spreader Beams for use on a Project off the West coast of Africa. The Spreader Beams were necessary for the Offshore Transportation and Installation (OT&I) of the Pre-Assembled Units (PAUs) on Floating Production, Storage, and Offloading vessels (FPSOs) for the project. Due to the project being executed on Exxon’s busiest rig, which was to continue operating throughout this project, these Spreaders were scrutinized at every stage to ensure the highest quality build to minimize any risk during operation. The Spreader Beams were built to the exacting quality requirements typically required for offshore projects which involved design, manufacture and inspection in accordance with a comprehensive and approved quality plan together with independent design review by an International Classification Society against a stringent marine operations and relevant API / AISC design codes.
Having successfully undergone a full quality management system audit by the client and end user, relevant procedures were issued by Modulift for approval by the customer. These procedures included Materials Inspection & Storage Procedure, Material & Weld Consumable Handling Procedure, Fabrication & Testing Equipment Maintenance & Calibration Procedure, Dimensional Control Procedure, Welding Procedures, NDT Procedure, Coating Procedure and Assembly Procedure. These procedures were complemented with a comprehensive ITP which identified critical points for identification, Verification, Notification and Hold Points where the client, end user and third party surveyor would carry out inspections prior to working progressing further.

The production of the Spreader Beam components was started and first entailed full inspection of procured materials and material certification by Modulift’s own QA Inspector, Classification Society Surveyor and End User’s Inspector. By the time this phase was in progress Modulift’s design team had already carried out and ensured that all verifications and calculations had been completed, that they satisfied the stated design criteria and had been submitted for independent design review which confirmed that the Spreader Beams were in accordance with the specified standards and addressed and fulfilled all relevant design factors such as dynamic amplification and skew factors together with taking into account any additional factors required by the Offshore Design Code.

Manufacture of the Spreader Beams went exceedingly well and all applicable hold points were successfully reviewed and endorsed by the relevant parties involved. Hold points included the full assembly and weighing of the completed Spreader Beam components which were then individually weighed using a calibrated load cell. Also at this stage, whilst the beams were assembled, the distance between lifting points were measured and found to be extremely accurate which was in itself a testament to the emphasis on quality that that had been invested throughout the manufacturing stage.

Once the Spreader Beams had been painted the final inspection phase was conducted over a two day period and involved final inspection of the actual Spreader Beam components themselves and a full review of the documentation and quality records that comprised the Manufacturing Record Book (MRB). Finally the Spreader Beams were assembled under the surveillance of a third party surveyor and final markings were applied before the beams were individually loaded and packed into bespoke, specially strengthened export packing cases which ensured that the Spreader Beams were fully compliant and ready to use when they reached their destination in Angola in the Autumn.

The project was completed on time and both Modulift and its lifting equipment passed with flying colours awarding them with continued worldwide vendor approval for its engineering and manufacture.

Modulift’s continued dedication to supporting the Oil and Gas industry can be seen through a variety of projects and companies around the world, from Exxon to BP, Shell to Saudi Aramco and including projects such as the Pluto LNG project for Woodside Petroleum in Australia. Modulift also works with many of their contractors such as Saipem, Weldex, Technip, Aker Subsea, Atlas Copco, Mammoet and Al Jaber.

Modulift has manufactured its largest ever spreader beam so far that can lift a staggering 1,500t at a span of 20m. The feat of below-the-hook engineering was delivered to Holland-based Safe Lifting Europe B.V, a sister company of Euro Rope Nederland B.V and an equipment / service provider to the marine industry, at the end of last year.

The MOD 800X/1500 has 1,000t / 800t, top / bottom wide body shackles at each end and is the second 1,000t+ spreader beam Modulift has manufactured in less than three months, as the super heavy lift sector continues to demand higher capacity equipment.

The latest beam received DNV Design Approval and DNV GL CG3 certification; the latter certifies that DNV carried out a full survey during the manufacturing and testing process, as well as approving the design. The beam took eight weeks to manufacture and test in a purpose-built compression test rig. The rig had to be upgraded so Modulift could apply a proof load of 1,650t (working load limit [WLL] x 1.1) to the spreader beam.

Sue Spencer, technical director at Modulift, said: “Despite the economic backdrop to marine and offshore markets, we are continuing to buck the trend and deliver landmark orders for customers who are looking for efficiency, flexibility and state-of-the-art engineering to support activities related to super heavy lifts.”

Spencer explained that this particular customer observes that marine influencers are increasingly looking for modular solutions to upscale lifting activities on topsides, in particular to avoid limitations associated with fixed systems. She also anticipates that the 800X/1500 beam will not be the company’s largest spreader for long, with the market showing an insatiable appetite to continue to upscale lifting capacities.

Sarah Spivey, managing director at Modulift, said: “Satisfying though it’s been to process these recent orders, we are not surprised. We have been aware of the potential at the super heavy end of the market for a long time – the middle remains quiet – and, like Sue, I don’t expect this to be our highest capacity beam for the long term. We have the engineering capability to go to 5,000t and the boundaries will continue to be pushed.”

Further testimony to the potential of the marketplace is the fact that the huiking beam was not acquired for one standout job, but for repeated use alongside other Modulift equipment, ranging from MOD 110 to MOD 600XB/800. Winches, spoolers, water bags, load cells, shackles and other rigging equipment are also widely utilised by its customer base.

Jacques Vroegop, technical director at Safe Lifting Europe, who took delivery of the 800X/1500 spreader beam, said: “We are working in a market that is showing unlimited potential in terms of capacity; we could be talking about much heavier lifts becoming commonplace. At the moment we are working with cranes offering up to 1,000t capacity but we are in a very dynamic sector.”
Rig Planning Services

At Modulift we understand that organising a lift can be a complicated process with many factors that need to be considered. On top of all the other considerations is the rig planning for the lift. With our highly trained specialist Lifting Engineers, Modulift can help you.

It may be a simple configuration or it may be a more complicated rig. Send us details of your lift including weight, lifting point and position, height restrictions, load type, centre of gravity (COG) position, crane type and lifting environment and we can help advise the best solution for you.

Your Guide to Some of the Configurations Available to You

1. Simple Single Beam 2 point Lift
   A single Spreader Beam is the simplest configuration and is suitable for 2 point lifts. The Spreader Beam absorbs the compression forces to protect the load being lifted.

2. Single Beam 4 Point Lift
   This configuration again uses a single beam where the load being lifted has four individual lifting points.

3. 1-Over-2 Rig
   We use this configuration when vertical slings are essential for 4 point lifts. By varying the sling lengths, we can also take into account an offset center of gravity.

4. 1-Over-2 InLine Rig
   Ideal for those lifts where the span is long and potential bending of the load is a problem. Further cascading layers are available to increase the number of lifting points.

5. 1-Over-1
   Where there are an uneven number of points to lift from a 1 over 1 system can be used to lift the load whilst still providing a balanced rig.

6. Various Multi Spreader Beam Rigs
   With our expert help we can address most lifting issues using a combination of our products to fit the application and the circumstances.

7. CMOD Spreader Frame
   The CMOD spreader frame uses corner units to connect existing Modulift struts into a 4 point modular spreader frame. This uses less headroom than a 1 over 2 rig.

8. Lifting Frame (H Frame)
   For extremely low headroom applications, Modulift can design and fabricate a bespoke lifting frame to suit your exact requirements.

Regulations, Standards and Compliance

Engineered products can be designed in accordance with the standards below or to your own requirements. We can also offer proof load testing, FEA and a variety of analytical reports.

UK & Europe Compliance
- DNV Standard for Certification No. 2.22 Lifting Appliances 2011
- Mod 6 up to Mod 800/1000 Type Approved by DNV
- LOLER: 1998 (Lifting Operations and Lifting Equipment Regulations)
- PUWER: 1998 (Provision and Use of Work Equipment Regulations)
- EC Machinery Directive 2006/42/EC
- BS EN 1993-1-1: 2005: Eurocode 3

USA Compliance

Australian Compliance

Russian Compliance
- EAC Mark – Eurasian Customs Union Technical Regulations Compliance.

Worldwide Compliance
- DNV Standard for Certification

DNV Standard for Certification

DNV 2.22: Modulift Spreader Beams designs conform to DNV Standard for Certification No. 2.22 Lifting Appliances. Modulift is the first and only Spreader Beam Manufacturer in the world to have the globally recognised DNV Type Approval for all Spreader Beams up to 1500t capacity in accordance with DNV’s standard for Certification No. 2.22 for Lifting Appliances 2011, at no extra cost to the client. For those customers who require a higher level of quality standard, Modulift also provides further options for project specific 3rd party verification. When a project demands the highest level of certification Modulift are able to offer our customers varying degrees of additional DNV certification depending upon their individual QA requirements, including:
- Proof Load Test Survey Report and Record of Test
- DNV Certificate of Conformity and DNV Type Approved

About our Standard Spreader Beams

Standard Modulift Spreader Beams: In accordance with BS EN 13155 – 2003. Available CE Marked and supplied with a Certificate of Conformity and DNV Type Approval, up to 1500t available off-the-shelf.

Individual Proof Load Testing of Modulift Spreader Beams: Modulift offer an individual Proof Load Test service with or without 3rd party verification to those requiring a higher level of certification. Please ask for further information.

Modulift Spreader Beams with project specific DNV Certification: Although our range Spreader Beams are now DNV Type Approved, we can also offer project specific DNV certification of individual Spreader Beams. It is the ultimate in certification and quality control for the most demanding project specification; a Modulift Spreader Beam individually certified by DNV in terms of design, manufacturing and Proof Load testing. Supplied with a design review report and Certificate of Conformity for Manufacture and Test, issued by DNV.

Our in-house engineers can design and manufacture a custom solution for all your lifting needs!