

WORLDWIDE HEAVY TRANSPORTATION AND LIFTING

OFFSHORE



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Offshore

ALE has a long and distinguished history supporting the offshore industry and today we're market leaders on a global scale. Many of our key personnel began their careers during the oil and gas boom of the 70s and 80s so our experience has been shaped by the evolving needs of the industry.

Technical advances in offshore installation and floatover capabilities have made the fabrication of complete topsides weighing upwards of 50,000te possible. We're continually developing new ways to safely load-out such structures using strand jacks, integrated skid systems, SPMTs and high capacity ballasting systems, and as a result, we've successfully loaded-out more than 1,000 structures across the world. One of our most recent innovations, the Mega Jack, is capable of lifting platforms of up to 50,000te to an elevation of 25m.

In fact our specialist services support every stage in the project lifecycle, from FEED engineering to the decommissioning of offshore facilities. We have state-of-the-art integrated ballasting systems with a typical capacity of over 60,000 Cu.m/h, advanced weighing equipment and a dedicated marine engineering division. With world-leading expertise in all of these areas, ALE offers a complete cradle-to-grave service in offshore skills.



With a pedigree in innovative engineering and an active R&D facility, ALE has always been known for developing new solutions to meet future needs. Over the years we've added to our world-class engineering skills-base through the acquisition of several successful specialist companies, and now we have more than 200 highly qualified engineers working at locations across the globe. This experience means we're well equipped to support the full FEED process, working through complex technical and logistical issues at an early stage to eliminate expensive changes later on.

Our FEED capabilities form a crucial part of the service we offer. ALE has contributed to many high profile projects that have been right at the forefront of global trends in the sector. We are able to adapt to ever-changing industry requirements, evolving safety standards and scope changes as the project gathers definition during the design process, while at the same time providing solutions which are as cost-effective and safe as possible. As a result, we're able to work closely with our clients from an early stage to establish what's required and provide practical engineering advice.

CGI modelling of the processes, designs and constructability also allows precise visualisation for the client review and subsequent presentations.

FEED services include:

- Special heavylift equipment implementation
- Conceptual offshore installation techniques
- FPSO construction studies
- Tension leg platform (TLP) topside and hull mating systems
- Equipment lifting and installation studies to determine the most cost and schedule effective methods of sizing and placing equipment
- Design of rigging and lifting equipment
- Outline design of new build site construction jetties
- Selection of optimum shipping methods and identification of suitable vessels or barges



Continuous HSQE improvements are a fundamental part of our ‘Smarter, Safer, Stronger’ ethos. Although extremely high, our standards in these four areas are continuously reviewed and refined so we remain at the forefront of the industry. This is overseen by a team of professionally qualified HSQE advisors who are dedicated to developing, implementing and evaluating our global policies.

ALE works to ISO 9001:2008 standards in quality management and ISO 14001:2004 standards in environmental management. Our global HSQE objectives include improving customer satisfaction and competence, and to this end we develop and implement internal training schemes based on our unique equipment, as well as delivering externally built training

courses that ensure adherence to the latest industry standards. We’ve also established Centres of Excellence in each of our service areas to enable experienced staff members to pass on their invaluable knowledge.

Our commitment to quality management, sustainability, professionalism and safety goes a step beyond the usual focus on people and profit. Despite the scale and ambition of the projects we undertake, we’ve succeeded in maintaining safe and healthy working environments in remote and challenging locations around the world. The many local and global HSQE initiatives we’re involved in are intended to help us maintain our excellent quality and safety record.



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FABRICATION

When offshore modules reach the fabrication stage, ALE can offer support in a number of areas. Our specialist services include weighing and onsite site moves for both smaller pieces such as bridgeways and derricks and complete fabrications, such as jackets and topsides.

With decades of experience performing site moves and sub-assembly site moves during the fabrication process, we're capable of working with complete precision despite tight time frames and limited room for manoeuvre.

Site moves and sub assembly site moves; transportation

With an extensive fleet of SPMTs, SPTs and skid systems held at strategic locations around the world, we're well equipped to perform site moves and sub-assembly site moves in any geographical region.

We'll provide the engineering, personnel and equipment to transport heavy items from fabrication yard to quay or other required destination. This enables our clients to build components using their full site facility.

► **Case study:** Knuckleboom Transport, South Africa

OVERVIEW: ALE serviced the local offshore market in South Africa by successfully transporting a 123te knuckleboom in the port of Cape Town.

SERVICES REQUIRED: The new knuckleboom will be installed on the Saipem 300 as a smaller service crane. The knuckleboom's height and high centre of gravity required a wider than usual trailer configuration to ensure stability. The manoeuvrability of the SPMTs allowed for sharp turns to be made and safe access into the dry dock area.



► Case study: Buzzard Field Development Project, UK

OVERVIEW: ALE have completed multiple weighing operations, site moves and load-outs as part of the Buzzard Field development.

SERVICES REQUIRED: During the first project, ALE completed various site moves and weighing operations which culminated with the load-out operation of the QU Deck with a load-out weight of 11,300te from Hartlepool, UK. During the course of the project ALE was responsible for preparing method statements, engineering calculations, moving various structures on site, loading-in the living quarters module and loading-out the QU Deck. ALE performed all barge management operations during load-out including mooring and ballasting.

ALE then went on to weigh all of the Buzzard new build facilities in 2007 in three different locations across Europe.

The third project, three years later, saw ALE complete the site move and load-out of a 7,500te production deck and 500te bridge from Hartlepool. The module was moved 1km from the construction site to the load-out quay using 320 lines of SPMT. To allow for different locations of build stool and sea-fastening grillage, the transporters had to be reconfigured at the quayside prior to load-out. ALE was also responsible for ballasting and mooring during the load-out operations.



Cranes

In addition to our transportation equipment, we operate a fleet of heavy cranes including crawler cranes and pedestal cranes ranging from 200 to 5,000te capacity. Our cranes – which are ideal for use in sub-assembly erection – are located worldwide to provide an efficient and cost effective solution, minimising mobilisation and maximising use.

We are proud to have introduced the world's highest capacity land-based crane the AL.SK190 and AL.SK350. With the ability to lift up to 5,000te, they can be dismantled and shipped around the world in ISO containers.

They are also capable of being relocated fully-rigged onsite saving considerable time during the construction of major projects. For ballast, the AL.SK190 and AL.SK350 use locally available material such as sand or gravel, which is loaded into 100te capacity containers. Uniquely, the ballast remains static while the crane slews around a pivot system, making them much more appropriate for congested sites than ring cranes. These cranes can offer significant benefits over traditional cranes and can substantially reduce construction schedules and costs.

► **Case study:** Installation of Jack-Up Drilling Rig, Mexico

OVERVIEW: ALE has performed the installation of the 402te leg sections and 575te living quarters of a jack-up drilling rig in Tuxpan, Mexico.

SERVICES REQUIRED: Both the installation of the leg sections and the lifting of the living quarters were carried out using the CC 8800-1 crane. The crane configuration for the leg sections was: 108m main boom, 12m fixed jib angled at 15° and 50m backmast. For the living quarters, this configuration was changed to 78m main boom and 50m backmast, working at 22m radius and with a 440te counterweight on the tray.





► **Case study:** Roll up, transport and load-out of a jacket, Lowestoft, UK

OVERVIEW: ALE was awarded the contract for the Thornton Bank jacket move, roll up and load-out.

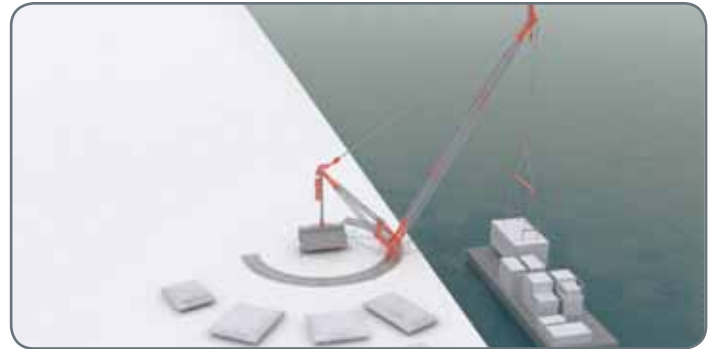
SERVICES REQUIRED: ALE successfully completed the site move, roll up and load-out of the 775te Thornton Bank Jacket. The project required the use of 36 axles of SPMT and the AK912-1 as the main lift crane. To achieve the roll up ALE worked in partnership with Ainscough utilising their Terex Demag TC2800-1 as the catcher crane. The dimensions of the jacket were 37m long, 23m wide and 23m high.



FPSO Module Integration

The AL.SK crane fleet provide ALE with the capability to lift all FPSO Modules from the barge using only one position.

This is possible due to the outreach of the crane and provides a solution to clients that saves both time and money. Utilising one position removes the need to move or rotate the FPSO and also enables all shore side connections, including water and electrical feeds, to remain in place throughout the construction and assembly of the FPSO.



The benefit of the outreach of the AL.SK190 crane was clearly demonstrated in the Valero Refinery as the crane was able to be rigged outside of the coker pit boundary.

► **Case study:** Replacement of coke drums at Valero Refinery, Houston

OVERVIEW: ALE was awarded the replacement of six coke drums at Valero Refinery in Port Arthur, Houston. This involved the disassembly and assembly of a 1,400te superstructure in a single piece.

SERVICES REQUIRED: The AL.SK190 was used to exchange coker drums, removing six old drums and replacing with six new drums weighing up to 471te each. The crane first lifted a 1,400te derrick structure, which was positioned on top of the existing coker drums at a height of 100m, and set it on the ground. The coker drums were then exchanged, and the derrick structure replaced.

The derrick lift performed by the AL.SK190 was the first time a complete derrick assembly consisting of triple drill towers and cutting deck, had been removed and replaced in a single piece. The lift required a complex tackle arrangement with a 12-point pick up only possible with the AL.SK190 crane. To successfully complete the project without the need to shut down the coker the AL.SK190 was rigged outside the boundaries of the coker pit. This also enabled the completion of the project with no permanent equipment in the refinery having to be dismantled, and the coke pit wall did not have to be removed.



Gantry systems

Our specialist lifting solutions include bespoke gantry systems for complex or unusual lifts.

► **Case study:** Installation of Living Quarters Module, Brazil



OVERVIEW: ALE performed the installation of the living quarters module at San Roque shipyard in Salvador de Bahia, Brazil.

SERVICES REQUIRED: The 1,350te living quarters module was lifted a total of 25m to the top of the deck using two ALE gantries and a fully computerised heavy lift system developed by ALE, the lifting operation was completed in five hours. After the module was lifted above the deck, the LQ module was skidded 22m longitudinally across the deck into final position using 16 skid shoes.



► Case study: Lifting and pulling of modules in Tampico, Mexico

OVERVIEW: ALE has successfully performed a number of transportation, lifting and pulling operations at the Dragados Offshore yard in Tampico, Mexico in three separate projects.

SERVICES REQUIRED: The first project involved the transportation of two lifting gantries. The gantries, which weighed 870te each, were moved 280m using five self-propelled transport platforms. Both gantries were moved with the stability leg and the lifting equipment already installed, and passed over the living quarter module and the 19m deck. The passing tolerance between the platform and the gantry was just 200mm at the most critical point.

ALE also performed the lifting and pulling of DOMSA modules across three distinct operations. Firstly, the 2,000te top module of the living quarter platform was lifted using eight SJ500s units in an operation that lasted eight hours. The lower platform of the structure was then pulled into position using skid shoes. The skidding manoeuvre, in which the modules travelled a distance of 68m, was completed in less than five hours.

In the third project, two offshore platform modules were lifted and pulled in three phases. Again, this involved the lifting of the upper module by means of eight SJ500s, the pulling of the lower platform from its temporary position to its final position under the upper modules, and the lowering of the upper module to assembling position. The lifting and pulling operations were monitored and controlled from strand jack control computers.



TOPSIDE LIFTING

ALE provides valuable assistance throughout the fabrication process by weighing modules to confirm the client and fabricator's weight engineering.

From our extensive fleet of equipment, ALE are performing weighings in excess of 100 support points. We have the ability to weigh structures from 10te to 40,000te with an accuracy level of +/- 0.5%, whilst confirming a structure's centre of gravity with precision.

Our weighing services ensure that work is carried out efficiently and cost-effectively. As required, we'll weigh modules multiple times during the fabrication process to confirm the traceability of fabrication weights. Load cell calibrations are carried out prior to each weighing operation, either at our main equipment base or onsite using portable calibration rigs.

► Case study: Turnkey Operations in Tampico, Mexico



OVERVIEW: ALE has provided weighing services in central Mexico for over 100,000te, and is now established as the region's leading sub-contractor for load-out and weighing work.

SERVICES REQUIRED: The weighing system ALE initially mobilised in the area – a fleet of 300s Weightor weighing jacks complete with computerised interface – is capable of lifts up to 4,000te and ideally suited to the typical eight-leg platform fabrications. As the size of fabrication projects increased, we mobilised an additional fleet of 500s Weightor weighing jacks, enabling weighing or jacking of up to 20,000te with short mobilisation periods around the Gulf of Mexico.

► Case study: Puerto Ordaz, Venezuela

OVERVIEW: ALE's comprehensive weighing system was put to the test for the complex jacking and weighing of a 7,100te topside platform at the VIHCOA fabrication yard.

SERVICES REQUIRED: Over the course of three days, 54 jacks were installed under the 7,100te platform. It was then lifted and weighed three times during a scheduled meal break using 500te capacity Weightor hydraulic jacks and load cells. All loads were monitored in real time, providing instant weight recordings and calculating the location of the centre of gravity to ensure the structure was jacked to a consistent synchronised measurement at every lift point.



ALE designed and developed the Mega Jack – an innovative tower system that can jack structures from ground level to heights in excess of 25m.

The system has a capacity of 5,200te per tower, and multiple towers can be used to achieve the capacity required for a project. A 10-tower system, for example, gives a jacking capacity of over 50,000te.

The Mega Jack is a fast, efficient and cost-effective solution to challenges posed by the fabrication of heavy topsides, modules and topsides typically associated with offshore floatover installations. ALE is proud to have developed this revolutionary capability as part of our full cradle-to-grave offering.



The ALE Mega Jack during testing



Site Works

Our extensive lifting capabilities mean we're able to fully service the fabrication market, including the fabrication of small bridges, transformer transports, small platforms, jackets and topsides.

► **Case study:** Bridge module load-out, Hartlepool, UK

OVERVIEW: ALE has successfully loaded-out a bridge module for the Britannia Satellite project in Hartlepool, UK.

SERVICES REQUIRED: The module, which weighed 555te and measured 90m long, 5m wide and 12m high at its highest point, had been fabricated in two halves and assembled on a previous visit using ALE transporters. The module had to be site-moved for a distance of 1km between various buildings on its route to the docks, before undergoing a side load-out onto the UR108 barge.



► **Case study:** ONGC North Tapti Gas Field Development, UAE



OVERVIEW: ALE successfully completed the transportation and load-out of piles and a jacket weighing 197te and 1,012te.

SERVICES REQUIRED: The piles and the jacket were transported from the assembly yard to the quay using SPMTs and then loaded-out onto a class 300 barge. Prior to this, the jacket had to be weighed to confirm its centre of gravity. Method statements and engineering calculations were prepared and submitted to meet both the client's and the independent marine warranty surveyor's requirements. ALE was also responsible for barge management operations during the load-out, which included mooring and ballasting.

LOAD-OUTS

The next stage in the process after fabrication is to load the structures out. ALE is an authority on the design and development of load-out systems for platforms and jackets.

Our range of services allow modules to be transported to the load-out quay from various fabrication locations on-site. This allows a single quay to be utilised for multiple structure load-outs.

ALE operates a wide range of equipment, which means we can design or supply the most appropriate load-out method for each project – whether this be SPMTs, strand jacks or self propelled skidding systems.

SPMTs

ALE own one of the largest SPMT fleets in the world. The 360° computer-controlled steering capability of our SPMTs provides a wide choice of build positions, and our trailer configurations are always designed to meet the specific parameters and constraints of each project.

Individual transporters can be hydraulically and electronically linked to provide a support platform matched to the characteristics of the load and the route. In addition, the low ground bearing pressures of our transporter units minimises the need for site preparation or strengthening.

► **Case study:** Jack-Up, load-out and float-off of offshore rig, UAE

OVERVIEW: ALE was contracted to jack-up, load-out and float-off a 5,995te offshore rig in Sharjah in the United Arab Emirates.

SERVICES REQUIRED: The 97m long, 63m wide and 40m high rig was transported using 216 axles of SPMT. The total load-out weight was 6,931te. The rig was loaded out onto the Hamiryah Pride barge for float-off. ALE provided all necessary engineering works from load-out to float-off.



► **Case study:** Teluk Ramunia, Malaysia

OVERVIEW: ALE completed the weighing and load-out of various modules for the F23R-A and CPDR-A offshore projects.

SERVICES REQUIRED: Modules included a 1,715te deck and a 1,882te deck, which were weighed using 8-point and 10-point weighing operations respectively. After weighing, the decks were loaded-out using more than

120 axle lines of SPMT to load the decks onto the transportation barges for offshore installation. The heaviest structure – a 5,800te jacket – was loaded-out using a skidding system with four SJ400 strand jacks and a centrally controlled 32 ballast/de-ballast pump arrangement. ALE also conducted all of the engineering work for the project and supplied 24 axles of SPT trailers to assist in the jacket and module construction phase.



► **Case study:** ONGC ICP-R Process Platform Project, Indonesia

OVERVIEW: ALE was engaged to move and load-out modules as part of the Process Platform Project. ALE was able to provide full engineering support on transport, mooring design checks and barge ballasting analysis.

SERVICES REQUIRED: Part of the redevelopment of the Mumbai High South offshore oilfield, the platform consists of a main structural frame, building module, process module, turbo generator and compressor module. With modules weighing between 1,400te and 2,850te, and one piece standing 45m high, this project showcases ALE's ability to provide innovative solutions in challenging situations. Due to its weight, ONGC initially specified for the heaviest piece, a 2,850te main structural frame, to be loaded-out using a skid system. However, after careful re-studying of the project, ALE was able to provide an engineering solution that would allow the frame to be shifted by SPMTs, achieving significant cost savings for the client and negating the requirement for additional equipment on site.



Strand Jacks

Alternatively, if there is an existing skidway, we can help minimise costs by providing the strand jacking equipment required to pull the modules for load-out.

Strand jacks provide a cost-effective lifting and pulling solution for the load-out of offshore jackets, platforms and modules. Using ALE's diesel driven power packs, they facilitate load-outs of up to 50 metres per hour. Our strand jacks range from 15te to 1,045te pulling capacity per unit.

► **Case study:** Load-Out of Module M35 PRA1 Platform, Brazil

OVERVIEW: ALE has successfully loaded-out the 5,500te M35 PRA1 platform for Petrobras in Salvador de Bahia, Brazil.

SERVICES REQUIRED: The load-out manoeuvre was undertaken using four SJ500 strand jacks. The total pulling distance was 170m with an average speed of 22m/hr during the load-out.



► **Case study:** Load-out of Offshore Modules M01, M02 and accompanying jackets, Rio De Janeiro

OVERVIEW: ALE successfully completed the load-out of one jacket (12,700te) and two topsides (6,200te and 8,000te) at Maua Jurong shipyard for the Mexilhão Project.

SERVICES REQUIRED: For the load-out operation ALE used four SJ850 strand jacks to skid the jacket and modules onto the Saipem 600 barge.



Skidding

ALE was the first company to design, develop and operate the hydraulic compensated skid-shoe system. It enables us to provide a skid track when there is no existing skid track available.

Our equipment includes hydraulic skid-shoes with stainless steel bases that move over low-friction blocks laid into steel skid-tracks. The systems we provide range from 25te to 1,250te capacity, with the option of combining a number of skid-shoes to create the most suitable solutions and perform skid load-outs in excess of 20,000te.

► Case study: Geoje-Si Skidded load-out, South Korea

OVERVIEW: In the heaviest ever load-out using a hydraulic skid system, ALE successfully performed the skidded load-out of a 19,400te topside platform.

SERVICES REQUIRED: Using ALE's pioneering new self-propelled hydraulic skidding system (SPHS) for the first time, ALE lifted the Gazflot topside from its fabrication supports and skidded it using 24 x 650te-capacity and 24 x 500te-capacity skid shoes, all integrated with hydraulic jacks to control the loadings and ground pressures. With all 48 skid shoes hydraulically connected, they provide a 3-point hydraulic supporting system. The project required innovative engineering to accommodate the need for different loads at various support points. Once the topside was skidded across the quayside onto the semi submersible transportation vessel, it was positioned onto grillages using the hydraulic cylinders.



► Case study: Jacket load-out, China

OVERVIEW: ALE was contracted to load-out the SHWE-SHP jacket weighing 21,234te in Chiwan Port, Shekou, China.

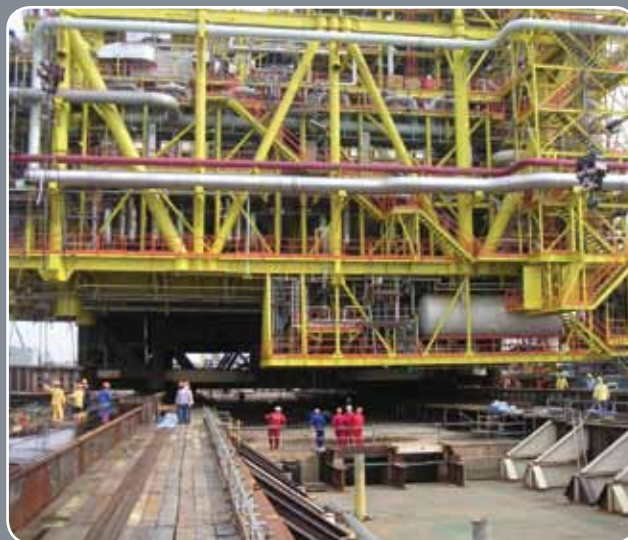
SERVICES REQUIRED: Four of ALE's SJ850s were used to transfer the jacket in two stages. The first was to transfer the jacket from its fabrication location approximately 60m to the quay edge. The second was the load transfer operation to move the jacket a further 137m to the stowage location on the barge.



► **Case study:** Bunga Ryer topside load-out, Malaysia

OVERVIEW: ALE was engaged to engineer, design and perform skidding for the load-out of the 9,194te BRE topside onto a semi-submersible barge.

SERVICES REQUIRED: ALE used four SJ600s for the skid load-out, each of which has a safe lifting load of 600te and a safe pulling load of 760te. The pulling loads were monitored and recorded using ALE's strand jack control system. The combination of high flow diesel hydraulic power packs, PLC-enabled strand jack control systems and monitored strand jacks enable ALE to operate at consistently high speeds during load out operations. As a result, ALE has a track record of performing load-outs at a speed of 50m/hr.



MARINE ENGINEERING

Throughout the load-out studies and operations, ALE is also able to provide full marine engineering support, including quayside and bollard analysis, ballast calculations, mooring calculations, barge deck strength analysis, marine management and sea fastening calculations.

ALE's dedicated Marine Engineering division, Headquartered in the Middle East but with a presence in strategic locations around the world, can co-ordinate and liaise with the client throughout all of the above stages to complete the load-out operation on time, on budget and to international safe working practices, including GL-Noble Denton, Det Norske Veritas and London Offshore Consultants.

ALE owned barges

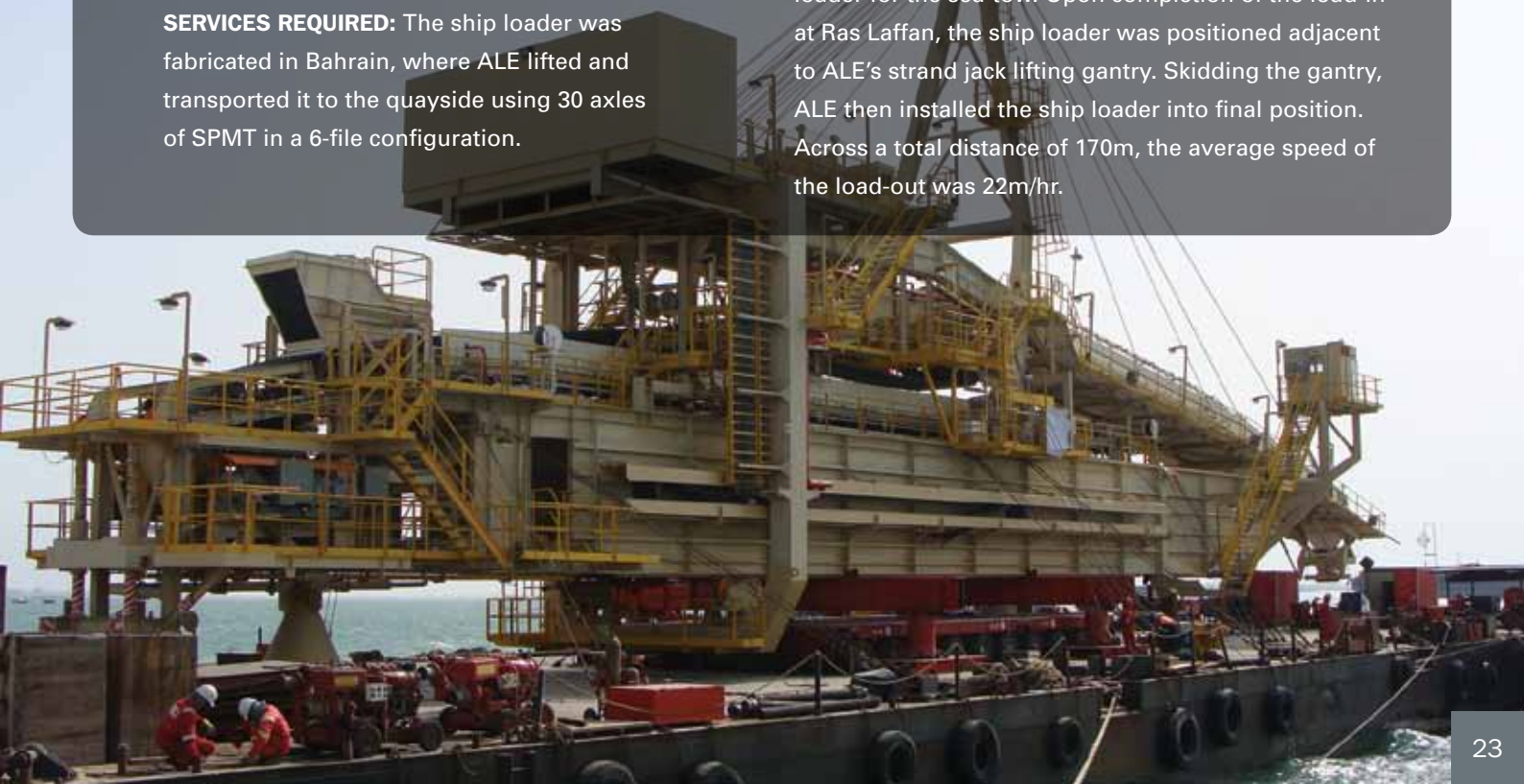
As part of our commitment to offering a full turnkey service, ALE has invested in two purpose-built barges that are based in the Middle East, a class 250 and class 300 barge.

► **Case study:** Load-In and Load-Out of Ship Loader, Ras Laffan Port, Qatar

OVERVIEW: ALE successfully completed the land transportation, load-out, marine transportation and load-in of the 350te sulphur ship loader 'B' as part of the Common Sulphur Project.

SERVICES REQUIRED: The ship loader was fabricated in Bahrain, where ALE lifted and transported it to the quayside using 30 axles of SPMT in a 6-file configuration.

Throughout the load-out, the barge deck and quayside were kept level using ALE ballast pumps in line with tidal and load-out calculations. Once positioned onto the ALE 250 class barge, ALE sea-fastened the ship loader for the sea-tow. Upon completion of the load-in at Ras Laffan, the ship loader was positioned adjacent to ALE's strand jack lifting gantry. Skidding the gantry, ALE then installed the ship loader into final position. Across a total distance of 170m, the average speed of the load-out was 22m/hr.



Ballasting

Whilst deck pumps are usually sufficient for SPMT modular load-outs, the greater weights and duration of a skidded load-out requires a comprehensive external barge ballast system to compensate for 24 hour tide cycles and load transfer. ALE is capable of performing barge-ballasting operations on any barge and any tide combination.

Drawing from our extensive fleet of hydraulic and electric submersible pumps, ranging from an effective delivery of 150 Cu.m/h to 2,400 Cu.m/h, ALE have the capacity to design, supply, install and operate fully integrated external barge ballast systems – typically in excess of 50,000 Cu.m/h.



► **Case study:** Kinabalu Rnpg-B Project Load-Out, Malaysia

OVERVIEW: ALE's Malaysian branch and ALE – Offshore Services successfully collaborated to perform engineering and ballasting services during the load-out of the 5,500te KNPG-B jacket in Malaysia.

SERVICES REQUIRED: The scope of work included detailed engineering, control and supervision of the ballast system for the load-out of the jacket. In addition, ALE provided engineering and operation of the strand jack pulling system, including the design of the strand jack brackets and the 'deadman' anchor.



► **Case study:** Topside Load-Out, Koje, Korea

OVERVIEW: ALE supplied and operated an external ballasting system for the load-out of the 21,800te and 28,000te LUN-A and PA-B topsides, as well as performing the load-out engineering and barge management.

SERVICES REQUIRED: ALE used computer modelling to analyse and design a pumping system capable of delivering the high flow rates necessary. The flow distribution system was based around ALE's stock of standard 250mm, 400mm and 600mm bore lightweight galvanised pipe lengths and elements that are provided for all of ALE's ballasting operations. ALE's ballast monitoring system provides real-time feedback from transducers temporarily installed throughout the barge and can be programmed with the necessary steps of load-out versus tide and load transfer to target each critical stage of the load-out.



► **Case study:** Bos Shelf, Azerbaijan

OVERVIEW: ALE was awarded the contract to supply and operate an external barge ballast and de-ballast system for six jackets as part of the ACG Full Field Development in the Caspian Sea.

SERVICES REQUIRED: The jackets were loaded-out onto the barge using a gripper jack system, with ALE providing the pumping and flow distribution elements and computer monitoring of the ballasting.

OFFSHORE INSTALLATION

With budget, location and oceanography constraints, alternative methods of Offshore Installation from the typical heavylift vessel are often called upon. ALE's experience coupled with our innovative R&D division are at the forefront of designing and performing alternative offshore installations.

► **Case study:** Load-out and float-off of Jack-Up Rig, Vietnam

OVERVIEW: ALE was contracted to carry out the engineering, load-out and overall transport and installation management of the first jack up rig fabricated in Vietnam. The scope of work also included the engineering and management of the float-off from the semi submersible vessel.

SERVICES REQUIRED: ALE successfully completed the skidded load-out and float-off of the 9,400te drilling rig. ALE designed the necessary temporary works for the jack up rig to be skidded from its fabrication location,

over the quay and onto the semi submersible vessel. ALE supplied the strand jacks and an external barge ballast system to skid the 9,400te drilling rig during the load-out. ALE also chartered the semi submersible vessel and main tug to provide the load-out and float-off turnkey project.

This major milestone for Vietnamese fabrication was engineered through ALE's Marine Engineering division and observed by Vietnamese government officials, including the Prime Minister.



Floatover installation – High deck mating

With the limitations and significant costs involved with heavylift vessels, an alternative method of the installation of topsides is often called upon. Using a combination of a large temporary load-out frame and ALE's high capacity barge ballast system, the total weight of an offshore floatover installation is virtually limitless.

► **Case study:** Offshore Sakhalin Island, Russia



OVERVIEW: ALE provided the engineering, equipment and offshore management of the high capacity barge ballast system required for two of the world's heaviest floatover installations, weighing 28,000te and 32,000te.

SERVICES REQUIRED: To meet the clients specification of a barge decent rate of 1m in 20 minutes, ALE used computer modelling to design a pumping system capable of delivering sufficiently high flow rates, and fabricated additional pipework as required. The two purpose-built barges transported the topsides 1,500 nautical miles to the offshore installation site off the coast of Sakhalin Island, where ALE also performed all the engineering associated with the mating, including ballast and mooring calculations.

► **Case study:** North Belut floatover installation, Indonesia



OVERVIEW: ALE performed the ballasting and floatover installation in Conoco Phillips, Indonesia as part of the North Belut Ballasting project.

SERVICES REQUIRED: ALE used 10 x 24PS ballast and 15 x 10PS de-ballast pumps to perform the floatover operation of the module weighing 15,100te and its 1,100te transport frames. ALE subsequently worked with the same transport and installation contractor to successfully install the Gajah Baru topside onto their barge two years later.

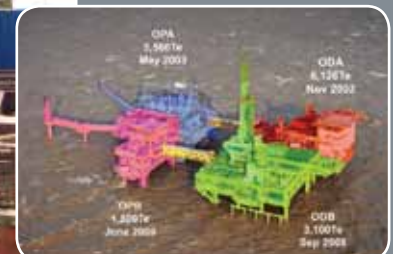
► **Case study:** Strand jack installation of Zhao Dong offshore platforms, Bohai Bay, China

OVERVIEW: ALE were contracted to develop a concept to install four offshore integrated platforms due to shallow water preventing installation by either a heavy lift vessel or a conventional floatover installation on a raised transportation frame.

SERVICES REQUIRED: ALE designed a concept to integrate the platform design legs that penetrate through sleeves of the main deck frames and mounting strand jacks on temporary platform on each leg.

The strand wire is connected to the main frame of the platform and the activation of the strand jacks lift the platform until final elevation is reached and the legs can be secured to the platform, locking the platform in position.

Over a seven year period, ALE installed two processing platforms weighing 5,560te and 1,800te as well as two drilling platforms weighing 6,126te and 3,100te using this concept.



Following on from the four successful installations in Bohai Bay, China, ALE has been approached by several markets to develop the concept further. New proposals under development by ALE include developing the scheme for deep water installation on jackets, offshore wind farm platforms and other installations requiring the structure to be lifted clear of the waterline. Current schemes and developed engineering see topsides of 10,000te in sea states of 1.5m.

Eco Mast Installation (EMI)

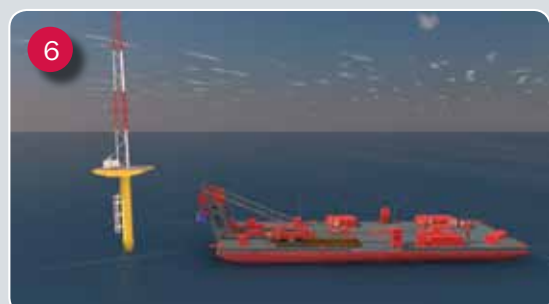
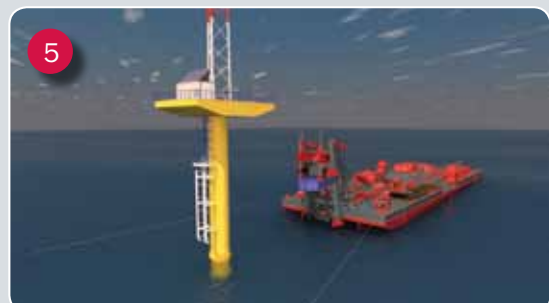
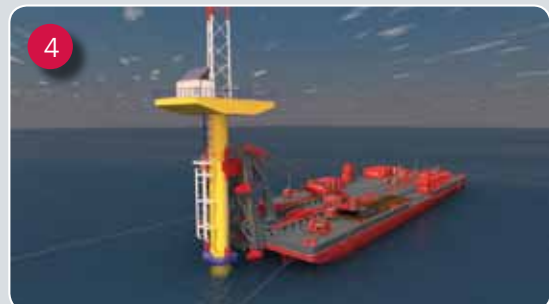
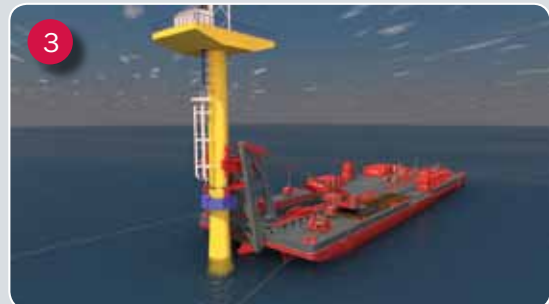
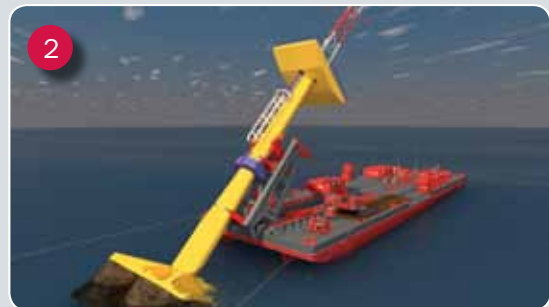
EMI is a new concept for installing metmasts offshore with the monopole foundation and metmast installed in one single operation. EMI has been designed with respect to sea life and the environment while cutting costs substantially.

ALE has teamed up with Mercon to introduce EMI. With EMI, no piles need to be driven for fixing the foundation to the seabed, making the installation eco-friendly. The structure is transported horizontally on a barge and upended to vertical position within an engineered frame. The structure is then lowered to the sea bed by strand jacks mounted on the barge, where pumps are activated. The design of the suction pile allows the mast to keep position without the need for hammered piles, whilst also allowing the mast to be repositioned or re-used if required.

Technical features EMI

- Applicable for water depths up to approximately 45m
- Can resist harsh North Sea conditions
- Suitable for various soil conditions such as sand and clay
- Powered by its own solar panels and small wind turbines, so 100% green
- Accessible by boat or heli winch
- Easy decommissioning and relocation

For more information visit www.emi-wind.com



► **Case study:** Installation of Riser Access Tower, North Sea

OVERVIEW: ALE successfully installed a Riser Access Tower weighing 800te using an innovative design for offshore installation.

SERVICES REQUIRED: ALE was contracted to install the Riser Access Tower (RAT) on the K15-FA-1 gas field. The RAT was built in sections, assembled by ALE using mobile cranes and on completion loaded-out onto a cargo barge using SPMT trailers.

ALE designed, fabricated and supplied the heavy duty grillages for the skidding installation system on the barge. The grillage design also integrated the main rotation point of the upending frame and the upending strand jack connections.

Once the barge was moored on location adjacent to the existing gas platform, the upending frame complete with RAT was skidded to the stern of the barge using ALE's skidshoe system and the strand jacks were used to rotate the RAT to vertical. Once the positioning was confirmed, the RAT was lowered to the seabed using two of ALE's strand jacks.



DECOMMISSIONING

The final stage in the offshore lifecycle is the decommissioning of abandoned facilities.

ALE is able to assist with this by performing the operations used to transport structures offshore in reverse. These services include all engineering support, management, equipment and personnel required to ensure that the return journey is completed using the best possible engineering solution, to deliver safely and on budget.



► **Case study:** Load-in of 17 structures as part of the Shell INDE (Structures Removal and Disposal) Project, Wallsend, UK

OVERVIEW: ALE was awarded the contract to load-in and site move eight jackets, eight topsides and one bridge from eight different barges over a three month period.

SERVICES REQUIRED: ALE have successfully completed the load-in and site movement of the jackets weighing between 800te and 1600te, the topsides weighing between 400te and 1,200te and the bridge weighing 80te. The load-ins were undertaken using various different combinations of SPMTs with a maximum of 56 axles on site at any one time. ALE also provided the barge mooring and ballasting operations for each load-in.

Topside Decommissioning

Through various FEED studies and progressive client discussions, ALE have preliminary engineered solutions for the receiving and partial dismantling of structures weighing in excess of 20,000te.



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