

CAPABILITIES





ALE is a global leader and continues to grow year after year by pursuing challenging new opportunities and delivering ingenious solutions.





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ALE combines exceptional project management with engineering intelligence to offer worldwide heavy transportation and lifting services to all industry sectors. Founded in 1983, the company has expanded steadily through a balanced strategy of organic growth and the acquisition of key companies whose experience has enhanced our specialist capabilities.

Now we're one of the world's major international heavy transport and installation contractors with a global network of operating centres and a large fleet of heavy cranes, specialist transport and installation equipment. As a complete solution provider for lifting, transporting, installing, ballasting, jacking and weighing large, heavy loads, organisations all over the world turn to us to push the boundaries of what's possible with their high profile projects.

We're committed to investing in technology, systems and equipment to ensure we remain at the forefront of the industry. Our dedicated Research and Development facility is responsible for the record-breaking SK190 and SK350 cranes, which have the capacity to lift up to 5,000te.

Crucially, however, we invest as much in our people as we do in our equipment, so we have a world-class management structure in place to support our technical potential. That means that as well as having the best project managers and engineers available today, we'll also have the best tomorrow. And with the ability to get maximum value from our next-generation equipment, we can meet our customers' needs effectively and build long-term strategic partnerships for an ever-improving service.

Our values of ingenuity, responsibility and flexibility reflect our combined commitments to safety and excellence. We take full responsibility for the quality of our processes to keep risk to an absolute minimum, while adapting to changing conditions and new challenges with competence and agility.

ALE's success is the result of employing the best people in the business and training them to the highest standards. The planning, engineering and management that goes into every ALE project is undertaken by dedicated personnel who have years of experience in ALE's specialist field.

Mark Harries, **Executive Director**



One of our core strengths is our commitment to responsible working practices and the importance we place in health, safety, quality and the environment. As well as complying fully with the most stringent local and international regulations, the company has a team of professionally qualified personnel who are dedicated to developing, implementing and evaluating our online Integrated HSQE Management System. All employees, in every country and at every level, are responsible for adhering to its guidelines.

Achieving a safe and healthy working environment is our priority, and one we've succeeded in maintaining despite the ambition and scale of the projects we undertake. Health, safety, quality and environmental considerations are reflected in all our activities, from the purchase, maintenance and improvement of plant and equipment through to the provision of HSQE advisors onsite. As a result of these measures we have an excellent safety record.

Our global HSQE objectives include prioritising customer satisfaction, continually improving competence, eliminating health and safety incidents and reducing waste and pollutants. We work in partnership with our clients and stakeholders to achieve high-quality, safe, efficient and environmentally-friendly working practices, rigorously evaluating our subcontractors and suppliers and encouraging them to implement their own HSQE policies and effective management systems.

Furthermore, we have established Centres of Excellence in each of our service areas to enable experienced members of staff to pass on their invaluable knowledge. This practical aspect of training complements comprehensive classroom-based study and external training.

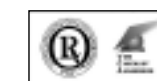
Our Integrated Management System has been assessed and certified by an accredited external organisation to Environmental standard ISO 14001:2004 since 2008 and to Quality standard ISO 9001:2008 since 1994.



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Civil

ALE has a long and proud history working closely with major civil engineering companies all over the world. With experience in high-profile infrastructure projects such as the removal and installation of innovative road, rail, river and canal bridges, lock gates, stadium roofs and airport architecture, we fulfil our role accurately, safely and with minimal disruption.

We have an in-depth understanding of the highly specialised equipment required for the safe and accurate execution of such projects. An appreciation of the control of loads and their distribution, as well as a fleet of Self-Propelled Modular Transporters (SPMTs) and proven expertise in lifting, skidding and jacking techniques means we're well equipped to move enormous structures with minute precision. Our strategically located equipment and full project management service means we can meticulously plan and execute complex projects despite the time-critical nature of much of this work. If necessary, we'll design purpose-built tools to ensure a project is completed to the total satisfaction of our client.



▶ **Case study:**
Alcántara Dam, Spain

▶ **Background:**

ALE was appointed to assist with the construction of a viaduct on La Plata highway over the Tajo River.

▶ **Services required:**

The viaduct consists of two main sections with a total length of nearly 400 metres, which are supported on concrete pillars rising from the banks of the river and from steel arches in the centre. ALE's responsibilities included pushing the bridge sections into place, skidding the steel arches over the bridge and lowering them into position, tilting and closing the semi arches, skidding the semidecks from both abutments and replacing the temporary supports with the final supports.



Power generation

The energy sector has been one of our core businesses since our inception, and to date we've worked on energy projects in more than 100 countries. Consequently, we're world leaders in global power plant lifting and transportation.

We've collaborated with all the major power equipment manufacturers to develop mutually beneficial technology and machinery as the power industry has evolved over the last 25 years. We have vast experience in transporting high-value components such as gas turbines, generators and transformers, providing delivery solutions for the power trains of Combined Cycle Gas Turbine (CCGT) equipment as well as moving and installing condensers, HRSGs and steam turbine equipment during the build process.

With a fully integrated 'from source to site' logistical service which combines technical excellence with rigorous safety standards, we work in partnership with our clients to solve their problems. Taking care of everything from investment and infrastructure to permits and programme, we also ensure health, safety and environmental factors are considered at every stage.

▶ **Case study:**
Staythorpe Power Station, UK

▶ **Background:**
ALE was asked to provide an innovative solution to the complex delivery of a four-unit CCGT power station. The project involved river transport, SPMTs and a 28-axle girder frame trailer.

▶ **Services required:**
Four gas turbines, four generators and four transformers – each weighing up to 370te – were received using SPMTs and stored prior to being transported down the River Trent by barge. ALE's Lift 'n' Lock system was used to trans-ship the cargo onto a girder frame transporter for a 30-mile road route. It was then trans-shipped to SPMTs for transportation on public roads using a second Lift 'n' Lock system. The final leg of the journey to site was undertaken using SPMTs for installation onto foundations using ALE's modular gantry system.





Nuclear

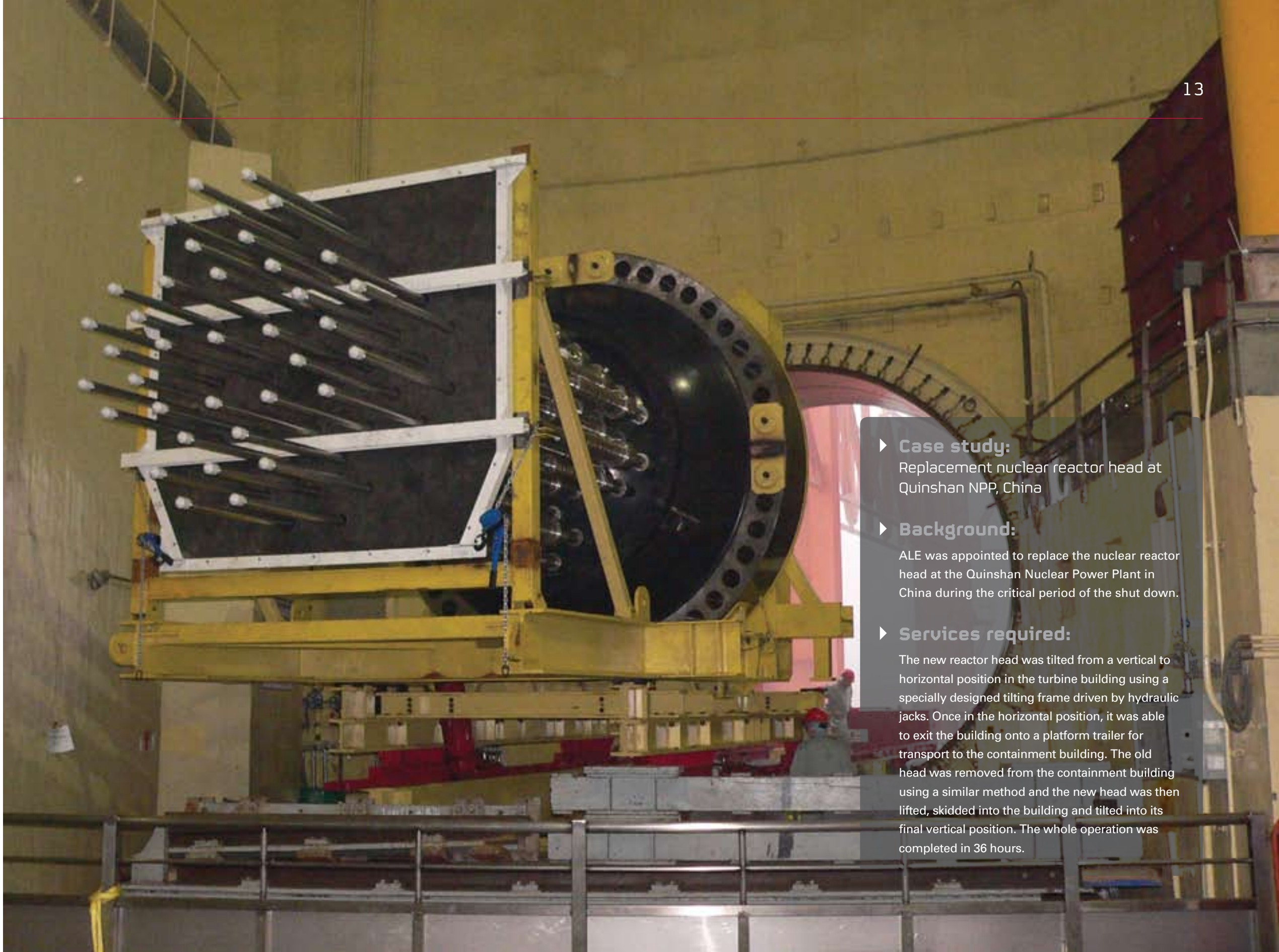
Nowhere does our reputation for safety, precision and responsibility carry more weight than in the nuclear power sector.

Our understanding of the health, safety and quality standards of the industry has enabled us to develop strong working relationships with key nuclear energy providers over the last 20 years, supporting projects ranging from the replacement of steam generators and reactor heads to the design of systems for dismantling turbines and electrical generators. From this platform of experience, we're well-equipped to support the imminent increase in nuclear power generation.

ALE is accomplished at carrying out pre-engineering works ahead of critical plant outages to ensure that the minimum programme and operational impact is made. To achieve this, we provide engineering resource early in the planning process to produce the necessary HSE and nuclear safety documentation.

Although we prioritise risk and safety, we also champion innovative engineering. Manoeuvres can combine lifting, tilting, skidding and hydraulic turning and this demands careful planning and faultless execution, with activity precisely scheduled to coincide with planned stoppages of the plant for minimal disruption and downtime.

Indeed such is our experience that we can design bespoke lifting systems to fit within existing station designs – a skill which has won us recognition for our flexibility and multiple project awards.



▶ **Case study:**
Replacement nuclear reactor head at Quinshan NPP, China

▶ **Background:**
ALE was appointed to replace the nuclear reactor head at the Quinshan Nuclear Power Plant in China during the critical period of the shut down.

▶ **Services required:**
The new reactor head was tilted from a vertical to horizontal position in the turbine building using a specially designed tilting frame driven by hydraulic jacks. Once in the horizontal position, it was able to exit the building onto a platform trailer for transport to the containment building. The old head was removed from the containment building using a similar method and the new head was then lifted, skidded into the building and tilted into its final vertical position. The whole operation was completed in 36 hours.



Renewables

ALE is playing a vital role in the renewable energy sector. Building on our 25 years' experience in the power sector, we have used our knowledge and experience to create smarter solutions to the challenges created by the increasing size and weight of wind turbines and associated components.

With innovative engineering we work to minimise the effect of weather delays and continuously improve health and safety standards. The development of innovative techniques also maximises the commercial savings for our clients in this progressive sector.

We are delighted to be putting our engineering capabilities to the test in this rapidly developing sector.

▶ **Case study:**
Greater Gabbard, UK

▶ **Background:**

The Greater Gabbard wind farm, located in the North Sea off the coast of Suffolk, will consist of 142 wind turbines with a total capacity of around 500MW when it's completed.

▶ **Services required:**

ALE's responsibilities included receiving and storing the offshore wind components and redelivering them to installation vessels as and when required. ALE minimised the risk of weather delays and issues associated with working at height by developing innovative handling solutions which reduce dependency on cranes and increase the speed and reliability of operations. ALE's handling solutions also help maximise the use of available land because ALE components require only a small access area around them – far less than larger crawler cranes would require. ALE created a purpose-built site for the EPC contractor which enables large quantities of wind farm components to be stored for any period of time to fit the offshore installation schedule.





Shipyards

ALE provides a number of services to the marine and shipbuilding industry, including the lengthening of vessels and the enlargement or complete revamping of hulls.



Other projects include handling vessels which can't be constructed on the slipway for launch and transporting ship sections from fabrication to installation yards. In fact we offer whole block transportation for major ship and submarine building projects which includes load-out, marine engineering, barging, transportation and lifting services. We're also regularly called on to expedite key repairs by removing engines or parts from engine rooms or suspending complete engines while work is carried out.

ALE plays a vital role in these processes, designing and implementing the movements of huge sections and positioning them for welding with complete accuracy. Our vast experience enables us to achieve these feats under extremely strict time constraints, keeping vessels productive until the very last minute for optimum commercial efficiency.

▶ **Case study:**
Enchantment of the Seas,
the Netherlands



▶ **Background:**
When ALE's client embarked on the revitalisation of their luxury cruise ships, they approached ALE to assist with the lengthening of M/S Enchantment of the Seas.

▶ **Services required:**
ALE's work scope included the load-out of a 2,800te mid-section in Finland, sea-fastening and barge transportation to Rotterdam. Following this ALE lifted the mid-section from the barge it was brought in on using eight hydraulic jacking towers. ALE then lowered it onto a hydraulic compensating skid system which ALE had installed at dock-floor level. The ship itself was docked on a specially developed skidding system on which ALE moved the bow of the ship forward. The mid-section was then accurately aligned between each end of the ship and inserted by means of the hydraulic skidding system.



Ports

ALE provides a range of services to ports across the world including the transportation, erection and vertical extension of harbour cranes. We also have the experience, the skills and the global sourcing contacts to relocate heavy port cranes and cargo handling equipment worldwide and to jack-up heavy cranes using state-of-the-art equipment so they're ready for new sections to be added. Our schemes for recovering cranes after collision or storm damage are designed to address the unique requirements of the circumstances.

As well as using our varied fleet of trailers and skidding capabilities to relocate cranes within ports, we also deliver new cranes from suppliers and ship cranes from port to port with all the marine engineering, barging and sea-fastening that entails. In fact, we've transported a variety of types of crane on five continents, with the result that both global and local manufacturers use us repeatedly to execute their projects quickly, efficiently and safely. Our continual investment in new design and engineering methods enables us to maintain our position as leaders in this field.



▶ Case study: Liebherr Container Cranes, UAE



▶ Background:

ALE was contracted to carry out the land and marine transportation of two Liebherr Container Cranes from Port Khalid, Sharjah to Khorfakkan Port.

▶ Services required:

With dimensions of 116 x 26 x 76 metres, the cranes required 96-axle SPMTs. The centre of gravity from the crane rails was 35 metres, so extensive engineering was needed to design safe and cost-effective sea-fastening and ballasting systems. The two cranes were transported by sea on a single barge (138 x 30 metres) for 176 nautical miles.



Minerals and metals

ALE provides essential services to the mining industry both in relocating heavy mining equipment on existing sites and in supporting modularization in new plant construction. Since advances in the industry have facilitated the building of mines in increasingly remote locations, we've worked closely with leading contractors to develop our ability to transport modules across the most inhospitable of terrains.

For existing mines, our SPMTs and lifting, jacking and skidding capabilities enable us to move fully assembled equipment – a much more cost-effective method than dismantling machinery to move it piece by piece. We can also deliver equipment to site from ports, again transporting items whole and positioning them exactly where they're required.

ALE's seamless logistics service and modularization abilities mean mine operators can have their heavy components moved safely and efficiently – whenever and wherever necessary.

▶ Case study:

Alcan G3 Expansion Project, Vietnam



▶ Background:

During a six-month period, ALE transported around 75,000te as part of the G3 expansion of Alcan Gove's alumina refinery in Australia's Northern Territory.

▶ Services required:

ALE loaded-in pre-assembled modules when they arrived in Vietnam from Thailand, and positioned them on top of pre-cast concrete bases using a ramp. This created a SUPERPAM for shipping to Australia that would be ready for load-out and installation on arrival. The modules were moved using SPMTs and are the heaviest to have been loaded-out in Vietnam – they were built with their foundations incorporated in order to minimise the site work required.

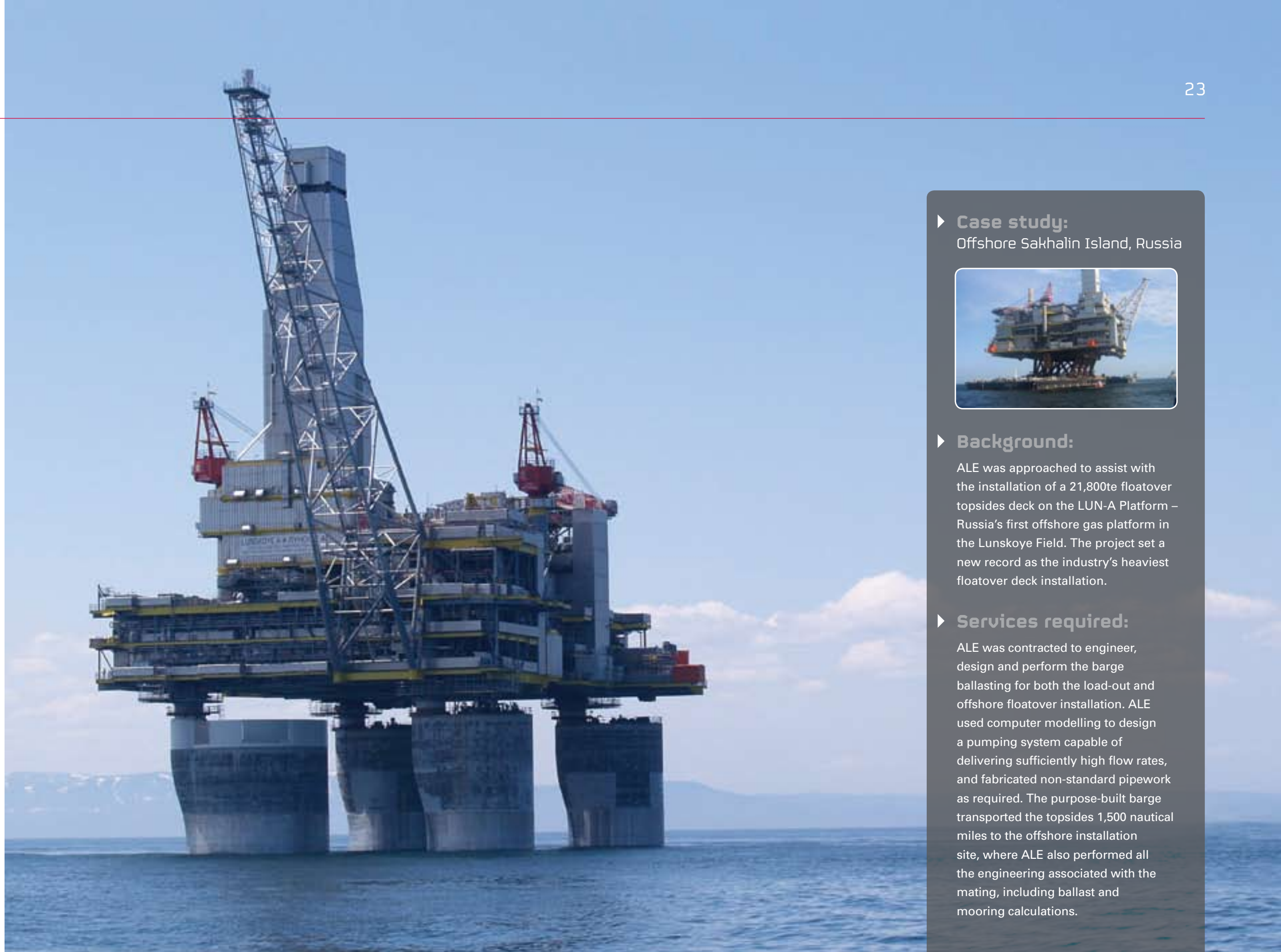




Offshore

Our heritage in offshore structures extends back many years, with some of our key personnel having begun their careers during the boom period in the '70s and '80s. Because of this, we are considered the market leader in providing specialist transportation services to the offshore industry. We've developed state-of-the-art ballasting and weighing systems, and loaded-out over 1,000 structures and probably more tonnage than any other company in the world.

Technical advances in offshore installation and floatover capabilities have made the fabrication of complete topsides weighing in excess of 30,000te possible. In response, we have designed and developed systems to safely load-out such structures using integrated skid systems, SPMTs and high capacity ballasting. Indeed ALE has succeeded in staying ahead of the industry by developing the mega-jack: a unique system capable of lifting platforms weighing up to 40,000te to an elevation of 30 metres. We are world leaders in floatover installations, having the largest integrated ballasting systems of over 60,000te capacity supported by a dedicated marine engineering division with years of experience.



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



▶ **Background:**
ALE was approached to assist with the installation of a 21,800te floatover topsides deck on the LUN-A Platform – Russia's first offshore gas platform in the Lunskoye Field. The project set a new record as the industry's heaviest floatover deck installation.

▶ **Services required:**
ALE was contracted to engineer, design and perform the barge ballasting for both the load-out and offshore floatover installation. ALE used computer modelling to design a pumping system capable of delivering sufficiently high flow rates, and fabricated non-standard pipework as required. The purpose-built barge transported the topsides 1,500 nautical miles to the offshore installation site, where ALE also performed all the engineering associated with the mating, including ballast and mooring calculations.

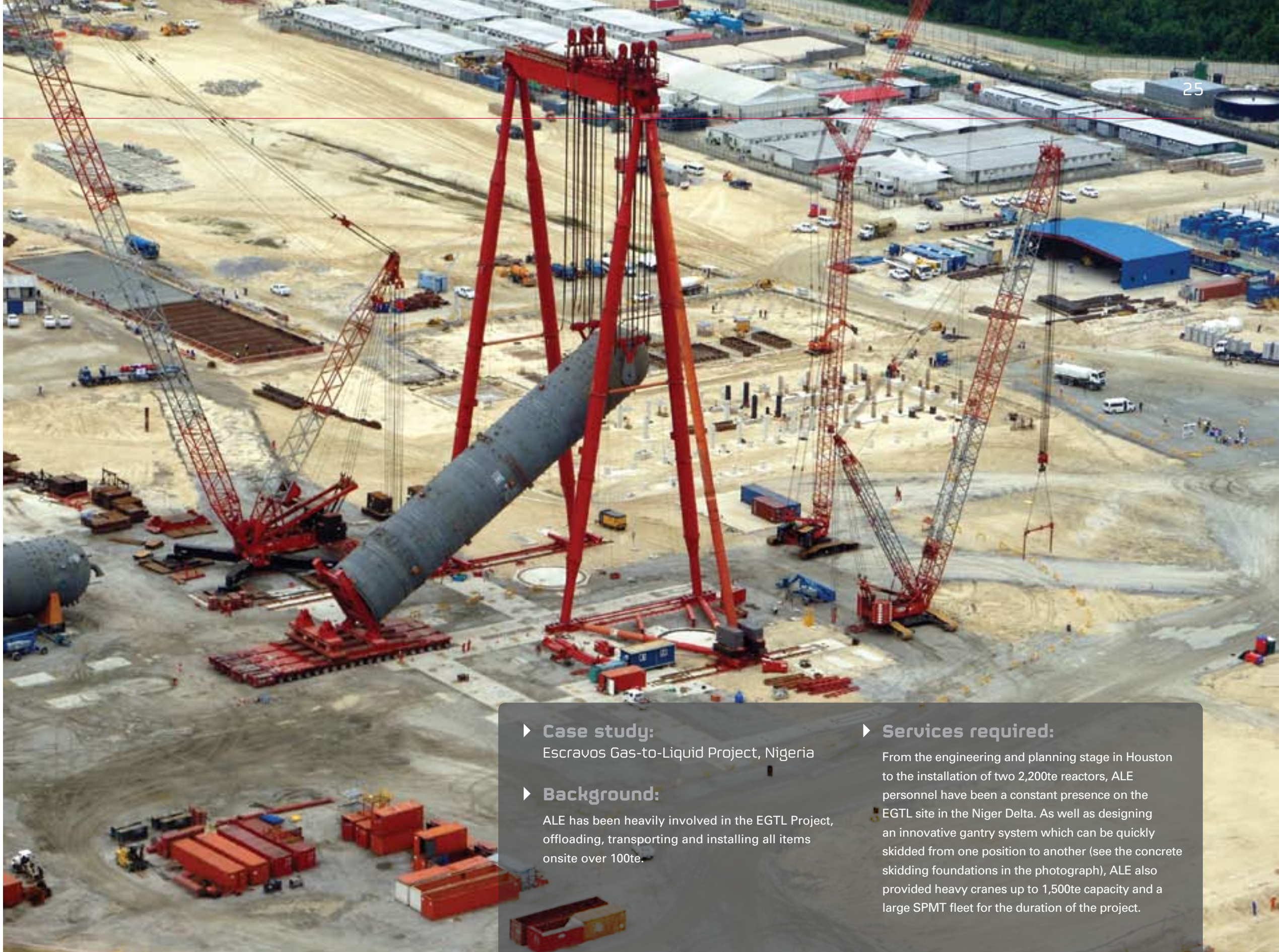


Oil, gas and petrochemical

With a presence in all the major oil and gas centres in the world, ALE works closely with blue-chip oil and EPC contractors to provide a fully engineered, efficient and cost-effective transportation and installation solution for the handling of critical items of process plant and equipment.

Given our intelligent engineering skills and aptitude for fastidious project management, we are well-equipped to meet the demands of long-term operations and high-pressure work carried out during revamps and shutdowns.

Our engineering skills enable us to transport, lift and position reactors, process columns, furnaces and other large elements, manoeuvring these items with precision and safety often in very restricted spaces and within tight time frames. Using combinations of advanced heavy lift cranes, trailers and gantry lift systems we undertake the replacement and installation of items including columns, boilers and fractioning towers, working towards an outcome that exceeds all expectations. Indeed our comprehensive fleet of heavy cranes – including the world's largest land-based crane – allows us to engineer schemes such as lifting 'off plot' that were previously impossible.



▶ **Case study:**
Escravos Gas-to-Liquid Project, Nigeria

▶ **Background:**
ALE has been heavily involved in the EGTL Project, offloading, transporting and installing all items onsite over 100te.

▶ **Services required:**
From the engineering and planning stage in Houston to the installation of two 2,200te reactors, ALE personnel have been a constant presence on the EGTL site in the Niger Delta. As well as designing an innovative gantry system which can be quickly skidded from one position to another (see the concrete skidding foundations in the photograph), ALE also provided heavy cranes up to 1,500te capacity and a large SPMT fleet for the duration of the project.



Transportation

With years of experience and one of the largest fleets of heavy transportation axles and ancillary equipment in the world, ALE is a globally renowned authority in moving heavy loads. Our substantial fleet of latest-generation equipment is operated by a team of highly trained personnel who maintain it to the highest standards. All trailers and ancillary equipment are strategically located around the world for maximum availability and to keep mobilisation costs to an absolute minimum.

ALE has pioneered the use of frame trailers in power plant equipment transportation. Our versatile fleet – developed and built in-house – can be configured to transport all types of generating equipment and to overcome route restrictions. In addition, our SPMTs dominate the current generation of heavy transport equipment by combining state-of-the-art design with tried and tested components. They make the movement of large items efficient, cost-effective and safe, and, coupled with our expert project management, completely seamless. These capabilities are further augmented by our considerable fleet of conventional modular trailers, which we frequently use for long distance road movements.



► **Case study:**
Salalah Methanol Plant, Oman

► **Background:**
Over the course of six months, ALE received 30 heavy lifts from ten ships at Salalah Port in the south of Oman.

► **Equipment used:**
The heaviest of these 30 items was a column weighing 471te with an offset centre of gravity. Due to weight and route restrictions a four-file, ten-axle SPMT with bolsters was required to move the 60-metre long, 9-metre diameter vessel.



Transportation



► **Case study:**
Piacenza, Italy

► **Background:**

ALE was contracted to transport two gas turbines and two generators from Marghera to Piacenza in Italy.

► **Equipment used:**

The images show the transportation of the first gas turbine, which weighed 310te. It was loaded onto a barge in Porto Marghera and taken to Mantova where it was discharged at the Belleli Energy Port. Using the port derricks, the turbine was then loaded onto a 30-axle frame trailer for delivery to Piacenza. The gantry and elevated skidway were prepared onsite to lift and install the turbine onto its supports. The remaining generators and turbine were delivered using the same methodology.



► **Case study:**
Separator transported on conventional trailer

► **Background:**

ALE used a conventional trailer to transport a 120te Separator for an FPSO being fitted out in Singapore.

► **Equipment used:**

ALE transported the Separator using a tractor and 14-axle Goldhofer trailer as part of a larger operation. This included the load-out of the Separator from the manufacturers, its transportation to a UK port, engineering and supply of lifting equipment and its shipment to Rotterdam.



Load-in and load-out

Having loaded-out more than 1,000 structures since the '80s, ALE is an authority on the design and development of load-out systems for platforms and jackets. Our speciality service allows modules to be transported hundreds of metres to the load-out quay, so that several modules can be built at the fabrication facility without impeding access to the quay, and multiple load-outs can be executed from a single load-out point. The result is minimum site disruption and maximum efficiency.

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. Low ground bearing pressures minimise the need for site preparation or strengthening. Alternatively, if there is an existing skidway, we can help minimise costs by providing the strand jacking equipment required to pull equipment for load-out, where our high capacity ballast systems with manifold and integrated pipework can perform ballasting operations of up to 60,000te per hour.



► **Case study:**
Buzzard Field Development Project, UK

► **Background:**
ALE successfully 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.

► **Equipment used:**
During the course of the project ALE was responsible for preparing method statements and engineering calculations, moving various structures onsite, loading-in the living quarters module and loading-out a QU Deck weighing 11,300te. ALE performed all barge management operations during load-out including mooring and ballasting.



Load-in and load-out



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

► **Background:**
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.

► **Equipment used:**
The jackets were loaded-out one at a time onto the barge using a gripper jack system, with ALE providing the pumping and flow distribution elements and computer monitoring of the ballasting. ALE overcame specific engineering challenges during the course of the project. Using CAD, ALE successfully configured the required ballast plan to overcome these obstructions without any reduction in flow rate.

► **Case study:**
ANGSI-D Project, Malaysia

► **Background:**
ALE undertook the site move and load-out of a 1,700te topside module for the ANCSI-D Project in Malaysia.

► **Equipment used:**
ALE used SPMTs for the site movement and load-out of the topside module, and assumed responsibility for all barge management, ballasting and engineering services during the operation.



► **Case study:**

Final launching of the Estrecho de Paredes viaduct, Spain



► **Background:**

ALE completed the launch of the Estrecho de Paredes viaduct, which bypasses the Estrecho de Paredes gorge and is part of a new highway in the province of Cuenca, Spain.

► **Equipment used:**

The viaduct was made up of multiple sections with a total length of 380 metres and a total weight of 2,700te. ALE used strand jacks for both pulling and restraining the bridge sections. Finally, each section of the viaduct was jacked down onto its permanent supports.

Skidding

ALE was the first company to design, develop and operate the hydraulic compensated skid-shoe system. Skid systems are designed to make safe and precise horizontal movements, and as such are an effective means of moving plant and structures in confined or restricted environments. The movement equipment has hydraulic skid-shoes with stainless steel bases which move over low-friction blocks laid into steel skid-tracks in an extend/retract sequence.

ALE operates 25, 50, 300, 500, 650 and 1,000te capacity skid-shoe systems, with the option of combining a number of skid-shoes to create the most suitable system for moving complex loads. This has enabled us to load-out structures weighing more than 20,000te. The integral hydraulic cylinder of the skid-shoes can be interlinked to provide a hydraulically compensated suspension system.



Skidding

► Case study:

Unloading, transportation and installation of two transformers, Russia

► Background:

ALE performed the unloading, transportation and installation of two transformers on the two 400MW CCGT power plant in Surgut, Russia.

► Equipment used:

Both transformers arrived on special railway carriages which could hydraulically jack themselves up in order to install ALE's climbing jacks and load-spreading mats underneath. Using a skid system the transformers were skidded sideways onto a temporary storage area, jacked up and positioned at the required height to allow a four-file, six-axle SPMT to drive underneath. The SPMT transported the transformers in front of their foundations and positioned them on using the climbing jacks and a skid system.



► Case study:

Skidding of a tunnel boring machine, Barcelona, Spain

► Background:

ALE carried out the skidding of a tunnel boring machine on a curve with a central radius of 220 metres.

► Equipment used:

Using four 500te capacity skid-shoes under the brackets closer to the cutting head and two 300te capacity skid-shoes under the brackets of the shortest articulated part, the machine was skidded a total length of 130 metres.



Jacking

Over the years, ALE has operated a number of jacking systems to suit the wide variety of work we do. These include strand jacks, which provide a cost-effective lifting and pulling solution for the fabrication and load-out of offshore jackets, platforms and modules. Our range of strand jacks varies from 15te to 900te capacity per jack.

More recently, we developed the 40,000te capacity mega-jack system which enables jacking of large structures from a low elevation up to 30 metres. It was designed to assist with the onshore fabrication of increasingly large and heavy topside platforms for the offshore industry, although its versatility means there is great potential for its use in other market sectors as well.

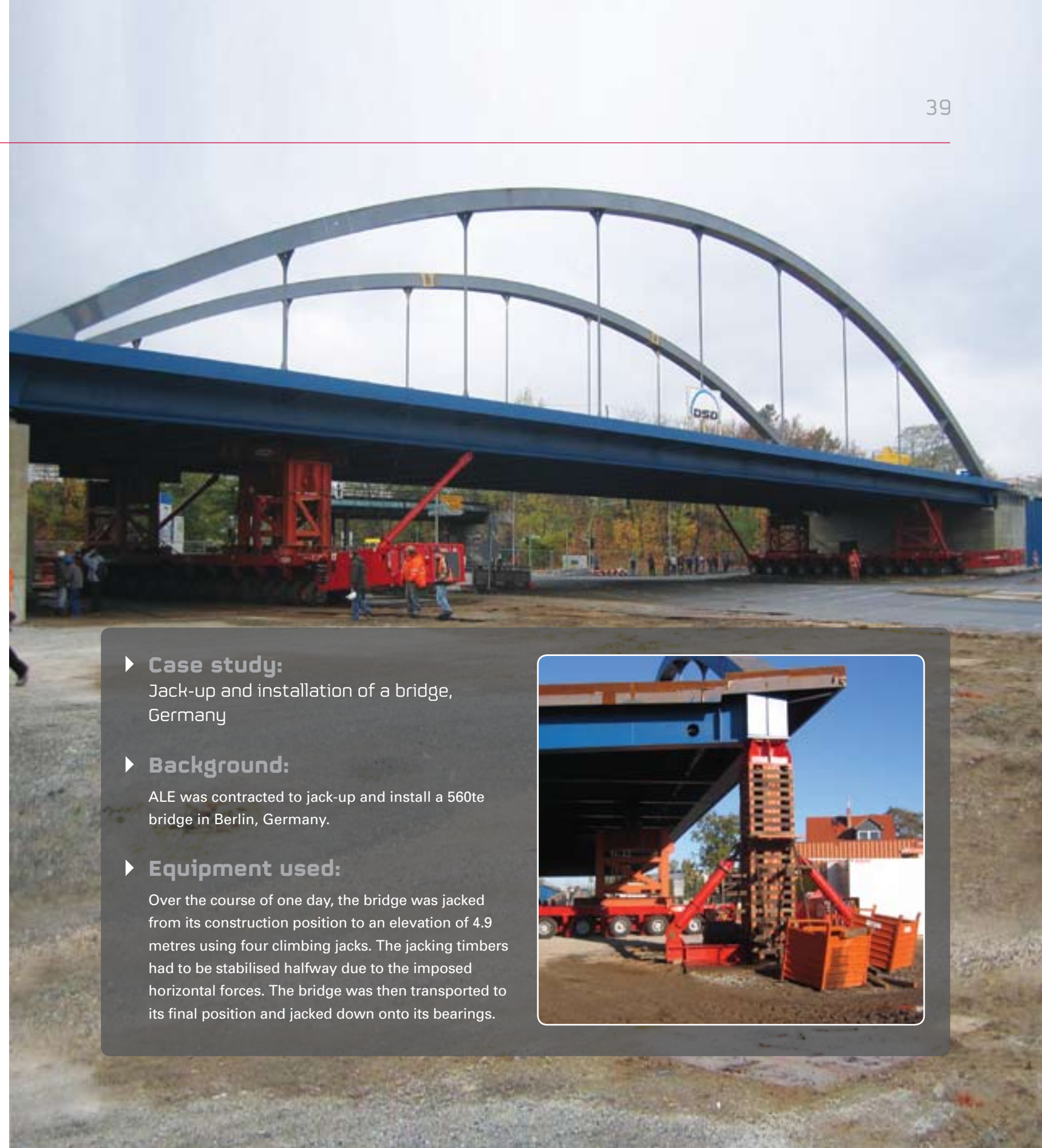
The mega-jack has both heavy and light jacking modes, and its modular set-up makes it suitable for a wide range of applications. By adding jacking towers, the capacity can be increased or the ground bearing loads per position reduced. A key difference between it and traditional jacking systems is that during normal jacking operations, the jacks remain at ground level and the steel jacking beams rise by each jacking step. This way all operations are performed at ground level and working at height is kept to an absolute minimum. ALE also operates a large inventory of hydraulic climbing jacks up to 1,000te capacity which can be operated in multiple hydraulic circuits for load equalisation.

► **Case study:**
Steam turbine generator, Qatar



► **Background:**
ALE transported a steam turbine generator weighing 230te and installed it at the Mesaieed Power Station in Qatar.

► **Equipment used:**
Using jacking towers and a four-point lift system, ALE installed the turbine onto a high-level foundation 12 metres above ground level.



► **Case study:**
Jack-up and installation of a bridge, Germany

► **Background:**
ALE was contracted to jack-up and install a 560te bridge in Berlin, Germany.

► **Equipment used:**
Over the course of one day, the bridge was jacked from its construction position to an elevation of 4.9 metres using four climbing jacks. The jacking timbers had to be stabilised halfway due to the imposed horizontal forces. The bridge was then transported to its final position and jacked down onto its bearings.





Weighing

The accurate weighing of items is essential for establishing that lifting and transporting methods are totally appropriate. Weighing operations help us to ensure that work is carried out as efficiently and cost-effectively as possible. With the ability to weigh structures from 10te to 40,000te, ALE performs weighing operations all over the world to internationally recognised standards, fabricating custom equipment as required.

Specific calibrations are carried out prior to each weighing operation, either at our main equipment base or onsite using portable calibration rigs. We are then able to guarantee accuracy to plus or minus 0.5% of the total weight of any structure, and can calculate with precision the centre of gravity.



► **Case study:**
Takula weighing operation, Korea



► **Background:**
ALE was required to perform the weighing of a topside at Samsung Heavy Industries facility in South Korea prior to skidding the module onto a barge.

► **Equipment used:**
Using 24 500s Weightor jacking units with integrated load-cells, ALE weighed the structure at 5649.28te. This weight result was 99.91% accurate giving a calculated centre of gravity to within 10mm.



► **Case study:**
Turnkey operations in Tampico, Mexico

► **Background:**
ALE has provided weighing services in central Mexico for a total weight of 92,945te, and is now established as the region's leading sub-contractor for load-out and weighing work.

► **Equipment used:**
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 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.



Lifting systems

ALE offers a specialist lifting service to all markets. With a strong heritage in engineering and innovation, we are perfectly placed to undertake the most complex and intricate lifting projects. Our team of experienced multidisciplinary engineers investigate and prepare lifting schemes and tailor-make solutions for complex lifting operations. Our range of lifting equipment includes bespoke gantry systems, modular tower systems, hydraulic lift systems and strand jack systems.

We believe that technology, design and ingenuity are essential requirements in providing customer-focused solutions that address the very specific challenges each project brings. The exclusive lifting equipment we've developed is the result of many years' experience and detailed research carried out by our Research and Development facility.



► **Case study:**

Uprighting of columns, Chile

► **Background:**

ALE undertook the uprighting of two columns at the Mejillones Power Plant in Antofagasta, Chile

► **Equipment used:**

Using two 45-metre, self-stabilising 'A' frame gantries, ALE successfully lifted and tailed two columns into the vertical position. Each gantry was provided with a 200te lifting unit and an auxiliary lifting unit for stabilisation and retention. The columns, measuring 85 metres long, were both manoeuvred upright and positioned on their foundations within five hours.



Lifting systems

► Case study:

Installation of living quarters module, Brazil



► Background:

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

► Equipment used:

The 1,350te living quarters module was lifted a total of 25 metres above the deck using two ALE gantries. Using 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 22 metres longitudinally across the deck using 16 skid-shoes.





Lifting systems

► Case study:

West Burton CCGT, UK

► Background:

ALE successfully lifted and installed a Gas Turbine Generator at West Burton 'B' Station in West Yorkshire.

► Equipment used:

ALE lifted the 239te Gas Turbine Generator from an SPMT to a height of five metres and propelled it 20 metres longitudinally before setting it down on its foundations using a Lift 'n' Lock. With a capacity of 426te at 12.4m, the Lift 'n' Lock integrates with ALE's Teflon-coated side shift to allow transverse alignment. Each jack was fitted with an electronic monitoring system developed specifically by ALE to allow real-time feedback to the operator, guaranteeing safe control of the entire lifting operation.





Heavy crane lifting

ALE operates a comprehensive fleet of heavy cranes including crawler cranes and pedestal cranes ranging from 200 to 5,000te capacity. The fleet includes some of the largest equipment and latest technology available today, and has been designed to provide a top-to-bottom range of capacities that – combined – act as complete project fleets, providing the range, sizes and capabilities to meet the demands of modern day projects.



The cranes are based in strategic locations worldwide to provide an efficient and cost-effective solution, minimising mobilisation and maximising use.

Our crane engineering and rigging teams provide innovative and client-focused solutions to their rigging and lifting requirements, and produce technically sound, well-thought-out schemes.

The SK190 and SK350 cranes

We are proud to have introduced the world's highest-capacity land-based cranes – the SK190 and 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 SK190 and 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:**
Olefins Plant, Saudi Arabia
- ▶ **Background:**
ALE was asked to complete major lifts at a petrochemical plant in Jubail in the Kingdom of Saudi Arabia using the SK190 crane.
- ▶ **Equipment used:**
ALE performed more than 100 lifts on this project during a five-month period. The SK190 crane was used to lift a depropaniser column and a C3 splitter column into place, working at 84 metres and 75.4 metres outreach respectively. The ability to lift these loads at such distances allowed onsite engineers to complete foundation and pipe racks in advance of installation.



Heavy crane lifting

► Case study:

Petrogalp Conversion Refinery Project, Sines, Portugal

► Background:

ALE was contracted to perform the land transportation, site movements and erection of 26 columns and reactors for the new Sines Refinery Conversion Project.

► Equipment used:

The scope of supply included up to 96 axle lines of SPMTs, CC8800-1 1,650te, LR1750 750te and CC2800-1 600te crawler cranes as well as hydraulic cranes and a tailing gantry device specially designed for the erection of the two main reactors. The heaviest lift was the Hydrocraker Reactor weighing 1,500te.



► Case study:

LOP Plant, Nan Hai, China

► Background:

ALE was contracted to engineer and perform the erection of 34 major columns and towers weighing up to 1,240te.

► Equipment used:

ALE supplied a 3,000te gantry system and two crawler cranes of CC2800-1 600te and LR1800 800te. A 1,400te capacity strand jack system was used to lift the process towers as the project site was very compact with no access for a large lifting crane.





Ballasting

Using a range of hydraulic submersible ballast and de-ballast pumps, ALE is capable of performing very high capacity barge ballasting operations – in fact we frequently supply ballast and de-ballast systems capable of in excess of 60,000 Cu.m/h. The system is fully computer monitored and can be used in conjunction with our innovative skidding equipment to perform sophisticated load-out operations.

Control of the ALE barge ballasting system can be offered at two levels: locally, via the mounted panel situated on each hydraulic power pack which allows the operator to control each pump or flow distribution butterfly valve individually; or remotely, using in-house designed software and accompanying PLC control interface panels mounted on each power pack.

We hold a variety of common barge configurations on database so as to minimise set-up time on new operations.

► Case study: CPOC, Malaysia



► Background:

ALE was tasked with completing the skidding, ballasting, barge management and load-out of a 4,500te CPOC jacket in Malaysia.

► Equipment used:

The operation was performed in three stages using four 500-tonne capacity strand jacks. The jacket was skidded 150 metres during stage one, a further 70 metres to the quay edge during stage two and then loaded-out onto barge SLB1 for the final stage. The ballasting operation was performed using ten submersible pumps with a total capacity of 9,000 metres³ per hour. The pumps were controlled from a single point using bespoke software operating each pump individually while monitoring the water level in each tank. Finally the barge was ballasted to its sea tow condition.



► Case study: Topside load-out, Koje, Korea



► Background:

ALE supplied and operated an external ballasting system for the load-out of the 21,800te LUN-A topside, as well as performing the load-out engineering and barge management.

► Equipment used:

ALE used computer modelling to analyse and design a pumping system capable of delivering the high flow rates necessary. The systems were based around ALE's stock of standard 250mm, 400mm and 600mm bore lightweight galvanised pipe lengths and elements. Additional branches were designed and fabricated using 700mm bore pipework to allow for the high flow. The PC-based ballast monitoring system provides real-time feedback from depth transducers fitted into each tank of the barge, and can be pre-programmed with the necessary steps of load-out versus tide and load transfer to target each critical stage of the load-out.



Logistics

ALE offers a wide range of global logistical solutions, particularly for the multi-modal transportation of oversized and heavy cargos. Our breadth of experience and enormous fleet of transporters and equipment gives us the ability to meet all customer requirements, no matter how challenging the project.

ALE's logistics capabilities range from the support of single import/export jobs to complete end-to-end projects involving the transportation of complex freight items across some of the world's harshest environments. We plan bespoke, multi-modal packages incorporating all the necessary services from our huge range to execute every delivery as expeditiously and cost-effectively as possible. All ALE departments and offices across the world work together to achieve this.

Our logistics projects include full 'blueprint to delivery' consultancy and all the necessary support services. We will handle, secure and supervise cargo, chartering marine vessels or aircraft and performing heavy lift engineering as necessary. We'll also manage domestic and international road and rail freight both in and out of gauge, and take care of import and export customs management as part of our worldwide door-to-door service.



► **Case study:**
Transportation of hydro turbine runner, Canada to Sweden

► **Background:**
ALE arranged the door-to-door transportation of a hydro turbine runner from Montreal, Canada to a hydro power station in Sweden.

► **Equipment used:**
The work involved in this logistical operation included a transport study from the factory to Montreal airport; a rigging study and loading and lashing plan at the airport; and rigging, discharge and transport studies for operations in Sweden including access to the underground turbine hall. ALE coordinated the transportation of the runner from the factory to Montreal airport and supervised the loading together with the chartering of the aircraft. ALE also oversaw the discharge in Sweden and the transportation to site.



► **Case study:**

Transportation and barging of evaporators, UAE

► **Background:**

ALE undertook a full turnkey project to transport, barge and install evaporators weighing 2,000te from Hamriyah to Fujairah in the UAE.

► **Equipment used:**

ALE's team of naval architects and engineering specialists carried out a range of services including ballasting, sea-fastening, barging, transportation from jetty and positioning onto foundation. In addition to 76 SPMT axles, ALE used their own London-registered, fully ballastable 76-metre barge, the ALE 250. The ALE 250 is equipped with winches, ballast pumps, integral load-out ramps and all machines and equipment required for sea-fastening heavy lift cargo.

Turnkey projects

In recent years, major new projects have grown both in size and in the demands of the highest standards in performance. Such projects require activities spanning multiple disciplines such as sea transport, land transport, lifting and installation as well as significant human resources in HSQE, engineering, project management and supervision.

In order to meet these requirements we formed a dedicated projects team that has the human resources necessary to address the demands and challenges posed by major projects. The levels of management and business processes that are required in these projects are addressed in the training of our staff.

Our highly developed project management skills enable us to undertake high-value, long-term transportation and installation contracts that require multiple teams to work together to deliver optimum value and efficiency.



Turnkey projects



► **Case study:**
Expansion of FCC Punta Cardón Refinery, Venezuela

► **Background:**
ALE managed several operations for the FCC refinery of Punta Cardón including the transportation of a new reactor; the site movement of a new domo; and the removal of the existing stripper, absorber, reactor, regenerator, fractionator and domo.

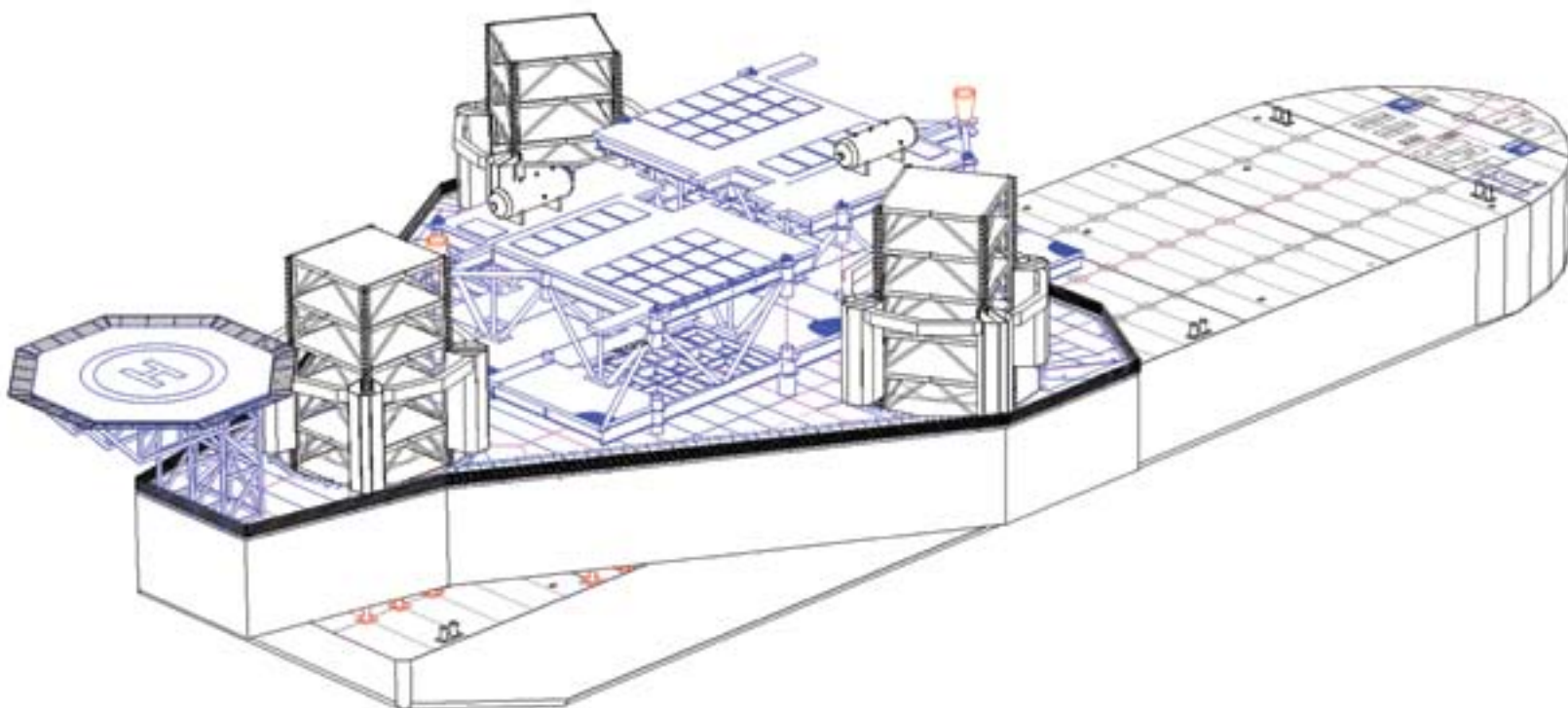
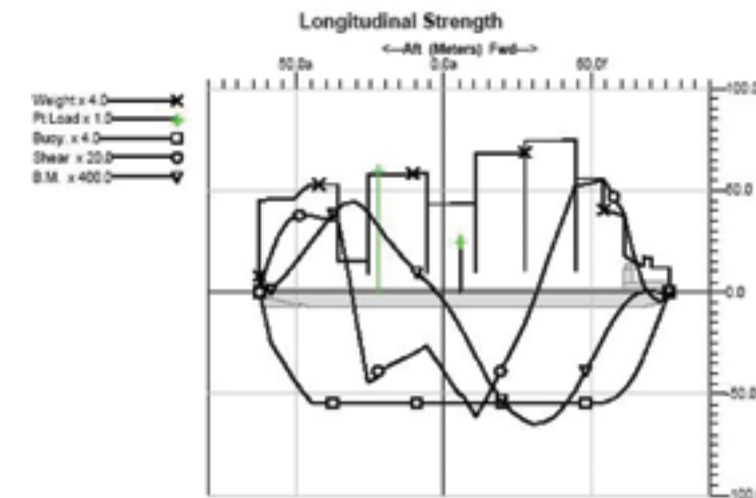
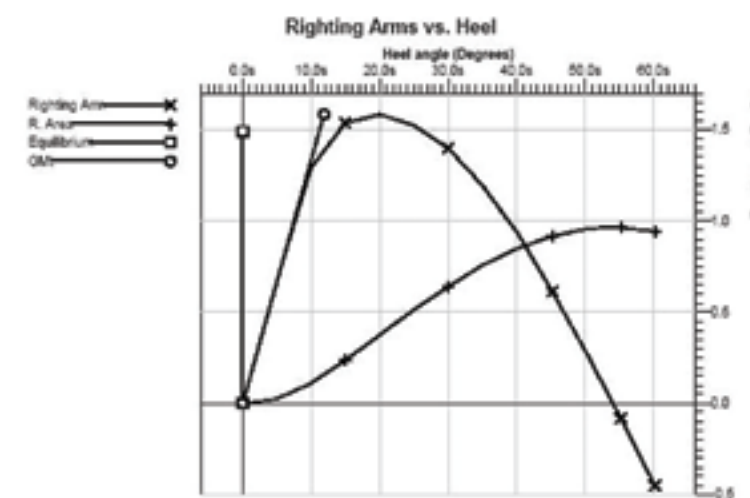
► **Equipment used:**
The removal manoeuvres were executed using a 70-metre, self-stabilising skidding gantry which covered an area of 45 metres² and included two strand lifting units of 500te capacity each. Transporting the 510te new reactor from the pre-assembling area to under the lifting gantry required 28 SPMT lines with a turning frame. Along the route, the transport had to negotiate bends of 90° and pass under a pipe rack. For this, ALE had to jack down the reactor along the total length of the pipe rack using four climbing jacks of 300te each and four skid lines with SS-150 skidding equipment. The new domo, weighing 420te, was moved using SPMTs.

Engineering

With more than 100 highly qualified engineers, a Research and Development facility capable of designing record-breaking equipment, and a pedigree in delivering innovative solutions for some of the world's largest organisations, our engineering skills are proven. Ingenuity is one of our core values, and a trait which is evident in every scheme we design and every problem we solve.

As a result, we've kept abreast of developments in all the industries we serve, indeed often devising, testing and implementing technologies ahead of when they're required. The mega-jack system we developed and our SK190 and SK350 cranes are recent examples of equipment that pay testament to this commitment to progress.

We also harness our knowledge and skills to provide proactive risk management, engineering and planning surveys, getting to the bottom of the complex technical and logistical issues facing each project at an early stage and collating our investigative efforts in a detailed technical report. Our experience means we're well-equipped to support the full FEED process, from conceptual design stage to the production of cost estimates.



▶ **Case study:**
Super M2 Rig Hull, UAE

▶ **Background:**
ALE carried out engineering works for the sea-fastening, ballasting, load-out and float-off of the Super M2 Rig Hull using a semi-submersible vessel.

▶ **Engineering required:**
ALE's team of naval architects and structural engineers provided engineering supervision, mooring calculations, barge deck strength analysis, semi-submersible longitudinal frame analysis, ballast calculations for roll-on and float-off, bollard pull calculations, sea-fastening calculations, semi-submersible stability analysis and marine management.

“Our philosophy is to produce engineers of the highest standard. We start at the recruitment stage, by employing the finest young graduates who demonstrate flair and innovation and who will enable ALE to undertake the most challenging projects for our customers. Our recruitment and training programmes include exposure to all aspects of our business, with introductions into offshore operations and marine, heavy-transportation and lifting together with design of new products at our R&D section in the Netherlands.”

Roger Harries, CEO



