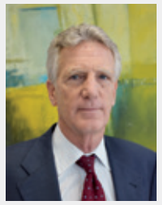
Al Jaber Heavy Lift

Safely onwards and upwards

# HIGHLIGHTS

# OVERCOMING CHALLENGES DURING A GLOBAL PANDEMIC



# WELCOME

We are delighted to welcome you to the latest issue of Highlights.

Within these pages, you will discover in-depth insights into the groundbreaking projects we have undertaken locally, regionally and internationally, all while maintaining our world-class standards in safe heavy lifting and transportation services.

The recent past has brought unique challenges to our business sector, including supply chain issues caused by the war in Ukraine and the effects of the global coronavirus pandemic, which significantly impacted our activities. Nevertheless, we are very proud of the way our teams have responded proactively to the challenges with resilience and versatility whilst making special efforts to work closely with our clients and the authorities to ensure that schedules are met despite the exigencies of resultant government restrictions and logistical constraints.

Our personnel have demonstrated time and time again their commitment to comprehensive preparations, precise execution and excellence in the field during a period in which we have executed a number of pioneering projects and achieved significant strategic milestones. Indeed, it is through their performance that, during this difficult period, we have been able to deepen our international roots and successfully carry out some of the most prestigious projects and complex contracts in AJHL's history. This result has been achieved in large part by our commitment to intensifying our approach to training and maintenance procedures. For this, and their ongoing contributions across our services, we are filled with pride and appreciation.

**Alexander Mullins**
Executive Director - Al Jaber Heavy Lift Group

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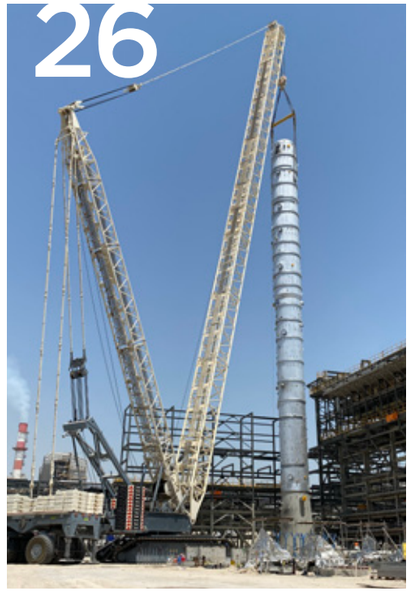
We would like to thank our teams for their excellent safety performance which is particularly noteworthy in the context of the global pandemic. As always, ensuring the safety of our people and providing the best quality performance in the field are our top priorities across the entire organisation.

Governments around the world implemented safety protocols to ensure the wellbeing of their citizens, including strict quarantine measures, which our teams navigated with minimal disruption to our projects. This is because in their preparations our teams always ensure that they develop detailed contingency plans involving risk assessments and mitigation procedures for all work fronts prior to commencement and on an ongoing basis.

Indeed, despite the external constraints, we expanded into new markets and added new state-of-the-art equipment to ensure that our fleet remains at the cutting edge of technology and can be tailored to provide flexibility for our engineers to comprehensively and effectively meet the project requirements of our clients.

We are very grateful to all the related parties of our business for their cooperation as we work together to ensure the best outcomes for all. We look forward to the future and continuing our mission 'safely onwards and upwards'.

**Syed Sabah Sabahuddin**
Managing Director, Corporate Office - Al Jaber Heavy Lift Group








**FRONT COVER IMAGE:** Brunei fertiliser jetty construction project *See page 4-5 for the full story.*

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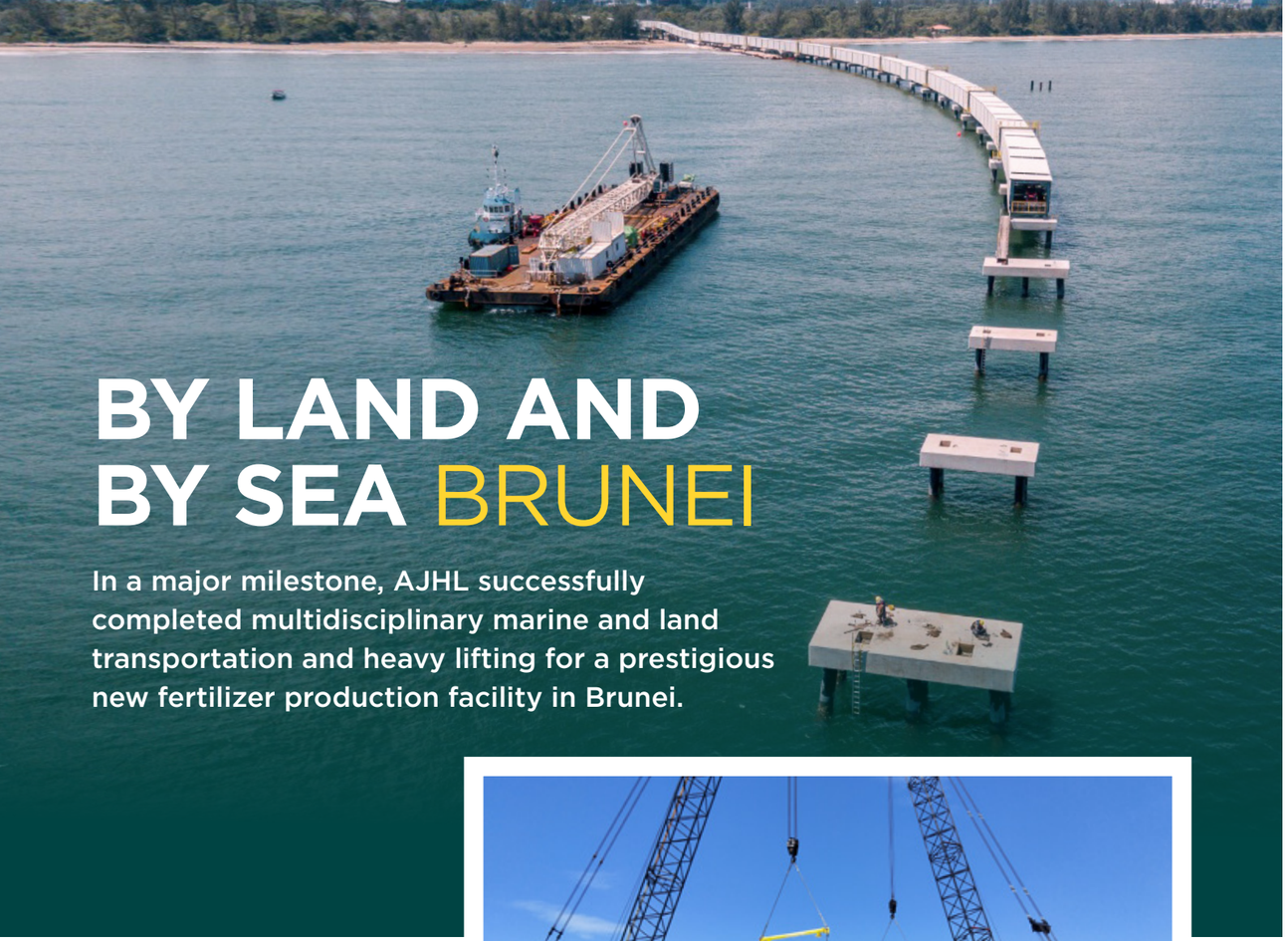


# BY LAND AND BY SEA BRUNEI

**In a major milestone, AJHL successfully completed multidisciplinary marine and land transportation and heavy lifting for a prestigious new fertilizer production facility in Brunei.**

The new facility will use the country's large natural gas reserves as feedstock to produce high-quality fertiliser. Located in the Sungai Liang Industrial Park, Brunei, the facility will have a production capacity of 2,200 tonnes of ammonia and 3,900 tonnes of urea per day. AJHL received the "Best Contractor" award in recognition of the successful completion of the scope of works despite the remote location, adverse weather conditions, and the global corona virus pandemic which serves as another example of AJHL's international expertise in integrated logistics. The AJHL scope of work focused on the construction of the jetty for the new facility comprising a conveyor gallery and ship loader modules. The jetty construction required heavy lifting, land transport, marine transport, and assembly yard loading as required for land and offshore installation.

With the 3.3km jetty arcing out into the South China Sea, and the client's supply base 50 nautical miles away, a modular construction methodology was planned. This included the engineered loading of modular elements to transport barges at the assembly yard and then transportation of these elements via barge with towing tug from the assembly yard jetty to engineered lift installation offshore.

## CHALLENGING CONDITIONS

Whilst the global pandemic put significant stresses on manpower and equipment mobilisation, having the same team involved in the project right from initiation and award ensured ongoing success through each stage of the project. From procurement to commencement, mobilisation, operations and eventual demobilisation, the project management team retained contractual compliance throughout and controlled the cost within budget. In many ways, the greatest challenge was to minimise the impact of adverse weather.

> Brunei is one of the world's largest producers and exporters of natural gas, and the new plant project will support the government's long-term development strategy to diversify the country's economy.

Coordinating the client's module supply program with weather suitability windows was essential given the requirement to load the modular elements onto transport barges at the assembly yard and then transport them with towing tugs across the 50 nautical miles to the jetty site, before offshore installation to pile heads from crane barges, often in very challenging sea conditions. Successfully ensuring safe mooring and installation with the barges was accomplished thanks to detailed weather window and contingency planning by the AJHL team.

## SUCCESSFUL AND SAFE

Despite the global pandemic raging, a dedicated AJHL team that peaked at 68 personnel managed the project safely and successfully to completion.

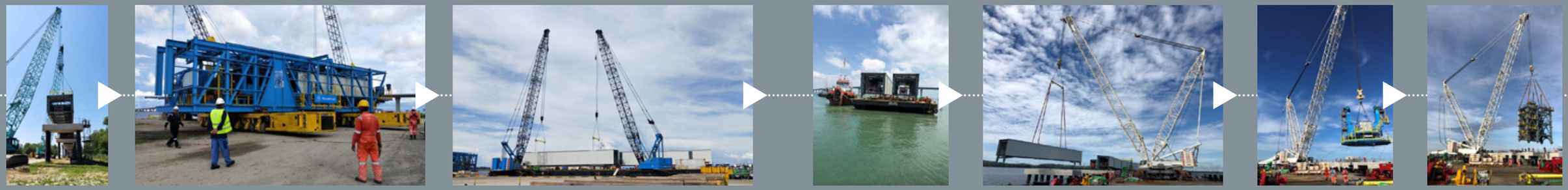
A full supervision team commenced operations at the AJHL Singapore facility, mobilising plant and personnel from the integrated wharf facilities which provided an excellent starting point to the project site in Brunei. This team included AJHL engineers to develop transport and lift studies for each element, and safety and quality assurance for all disciplines. As operations commenced at the site in a staged manner — and to uphold standards in keeping with government, client, project and company requirements — an AJHL team comprising a project manager, safety manager and officers, project engineer and draftsmen, equipment supervisors, operatives and full maintenance team were all relocated to Brunei.

With the jetty extending 2.5km offshore and 0.8km onshore, and ultimately comprising 50 ship loader modules (weighing 20 to 105 tonnes) and 108 onshore and offshore conveyor galleries (50 to 100 tonnes), a broad range of specialised equipment was required to execute works.

The range of AJHL equipment deployed included a 600te crawler on a 250-foot barge, a 400te crawler on 230-foot barge, a transport barge, tugs to manage the barges, with ballast pumps, winches, anchors, fairleads, load mats and the like to manage offshore mooring. Land-based equipment included two 250te crawlers, with a fleet of self-propelled trailers (60 SPT and SPMT overall).

The well-executed mobilisation and uninterrupted execution during the 12 month period, with zero breakdowns or safety infringements, to the client's full satisfaction is another great example of the AJHL motto to always strive 'safely onwards and upwards'.

## THE PROCESS...



# REFINED SUCCESS OMAN

**AJHL was tasked with the heavy lifting and transportation of several pieces of equipment for a major high-profile oil refinery project in Oman which, when put into operation will increase the crude refining and processing capacity of the plant to 12 million tonnes per year.**

As one of the biggest construction projects in Oman's oil sector, once put into operation, the crude refining and processing capacity of the plant will reach 12 million tonnes per year. The client appreciated AJHL's dynamic support in providing the equipment needed to complete the task which included valuable engineering advice as to the application of 48 axle lines of Self-Propelled Modular Trailers (SPMTs), ancillary equipment and various cranes with capacities ranging from 50 to 650 tonnes.

Consistent, clear and proactive communication was key to our very productive relationship with the client and the successful project outcome.

This dynamic collaboration created significant efficiencies on site to the benefit of the client by carefully tailoring solutions to client needs. For example, when the client faced space constraints in the lifting area during the proposed superlift operation, AJHL were able to solve the problem by reducing the superlift mast radius to fall within the client's criteria.

The project was completed according to schedule and met the client's high standards, thanks to AJHL's invaluable service execution and technical support with zero downtime.

The client was delighted with the outcome of the project, which was completed in accordance with their very high safety standards.



# LIFTING IN SYNC UAE

**AJHL was awarded a contract by a prestigious blue chip EPC Contractor for the inland transport and load out of a substation platform topside, jacket and piles for an offshore windfarm in the UK.**

This offshore wind substation in the UK will have the highest capacity in the world and is expected to generate enough clean energy to power approximately one million homes. The project involved lifting several heavy modules weighing up to 1,113 tonnes each, necessitating the use of four crawler cranes, with capacity ranging from 400 to 600 tonnes.

With meticulous precision, AJHL completed this successfully, minimising disruption on-site and enabling construction work to continue.

However, given the site congestion and the existence of multiple operations, AJHL had a significant challenge to overcome: how to integrate multiple cranes and their operations into limited work spaces safely and efficiently within the fabrication yard.

To meet this challenge and fulfil the client's expectations, AJHL brought their industry knowledge and experience to the fore, using variable superlift combinations to make the lifts possible. The job-specific requirements – lifting with four cranes in tandem – meant that the actual crane capacity had to be de-rated in accordance with BS 7121 requirements.

Even so each crane was able to lift the required 250 to 350 tonne elements within a working radius of up to 14 metres by providing an overall lifting capacity of up to 2,200 tonnes ie. an impressive 30,000 tonne-metres of load moment with all four superlift cranes lifting simultaneously.

With this much power in such a limited space, meticulous planning was needed to ensure site safety.

AJHL planned the multiple lifts to minimise changes in crane configurations and reduce the time spent. AJHL is proud to have delivered a successful project and demonstrated their ability to overcome complex logistical challenges.

# ENABLING GAS EXPANSION PLANS SAUDI ARABIA

## AJHL is proud to have played a significant role in the expansion of a major gas plant in Saudi Arabia

The project is part of the client's Energy Efficiency Programme, which includes the development of nine gas compression plants and associated infrastructure to improve the reservoir recovery rate and extend the production plateau of the gas fields.

Following the project's completion, this will significantly increase the production capacity of the plant, cementing its status as one of the largest gas processing units in the world. Raising gas production is key to Saudi Arabia's objective of decreasing reliance on the use of crude oil and liquids for power generation.

In fact, a key goal of Saudi Vision 2030 is to diversify the Kingdom's reliance on oil revenue, diversify its energy resources and optimise its overall energy mix. The aim is that by 2030, 50% of Saudi Arabia's overall energy mix will come from renewable energy sources.

AJHL's contract included the lifting, transporting, jacking and installation of 23 items of heavy equipment, with weights ranging from 100 to 800 tonnes. Accordingly, the fleet selection included a Demag CC 8800-1 (1600te), Demag CC 2800-1 (600te), Hitachi SCX 2500 (250Te), 28 axles of two file Scheurle SPMTs and 28 axles of single file Scheurle SPMT. Every stage of the project needed to be planned meticulously due to the constraints of carrying out the activities between the green field and brown field sites of the existing plants.

AJHL deployed their state-of-the-art Scheuerle split SPMT axles for transporting the heavy equipment since the space between the foundations was only 4.8 metres. Two file SPMTs would have yielded insufficient stability and 4 file SPMTs could not enter into the space between the foundations. Under the circumstances, in order to achieve the safety and stability of the load, the only option to transport the module between the foundations was to deploy their newly arrived split axles which gave an overall with of 4 metres.

Besides the logistical challenges of the locations, the biggest obstruction to the project was the impact of COVID-19, which disrupted the construction schedule due to border closures, personnel mobility constraints and the subsequent overlapping of various projects.

For AJHL, these challenges were an opportunity to demonstrate their adaptability to the constraints of the pandemic as well as those of the landscape. Thanks to AJHL's agility, as well as geographical reach and fleet strength, the team were able to provide the client with the necessary alternative "plan B" arrangements, whilst strictly adhering to COVID-19 safety precautions. This success can be attributed to a combination of new state-of-the-art fleet technology and a professional workforce who were able to integrate appropriate adjustments within their safety procedures and modular documentation into their day-to-day activities whilst making special efforts to work very closely with the client and related authorities to ensure that all pandemic requirements were successfully navigated.

AJHL is proud to have met the client's schedule and completed the scope of work to the highest standards despite the constraints posed by the global pandemic. Of course, the team will now apply the lessons learned during the project to future challenges through their QHSE procedures.

# TWIN TRIUMPHS FOR SOLAR ENERGY UAE

**AJHL was delighted to be called upon to work on a project that is central to the UAE's clean energy goals. The team were tasked with playing a significant role in the installation of salt frames, a key component of the largest solar energy plant in the country.**



This project is a 950 MW hybrid plant and is the largest single-site concentrated solar power plant in the world. It uses a combination of a central tower and parabolic trough concentrated solar power technologies to collect energy from the sun. The success of the plant is central to supporting Dubai's Clean Energy Strategy, which aims to increase Dubai's share of clean energy by 25% by 2030. Furthermore, the strategy aims to increase the clean energy share by 75% by 2050. AJHL is particularly proud to have worked on this project as it will contribute to the sustainability goals of the nation.

From the outset it was clear that this was no ordinary project and it would require a team with the prerequisite expertise and equipment to take on the huge lifting task.

As proud owners of a fleet of cranes up to 3200te capacity CC8800-1, and a wealth of industry experience, AJHL triumphed as the heavy lift contractor for the installation of two heavy salt frames, cold and hot, weighing 544 tonnes and 441 tonnes respectively to be lifted into place at up to 62 mts radius. Along with the Demag CC8800-1 TWIN (3,200te crawler), a range of other crawler cranes were provided including a Demag CC2500-1 (500te), a Hitachi SCX2800-2 (275te) and a Demag AC100 (100te) telescopic support crane. To coordinate a lifting and installation scope of this size, AJHL deployed a team of 25 personnel to be on-hand to provide the client with project management, engineering and operational services.

The salt frames were fabricated at a nearby area and, thanks to the high lifting capabilities of the Demag CC8800-1 TWIN, the team were able to lift the frames directly from the fabrication area upon completion of assembly and lower them into final position. As a result, AJHL eliminated the need for additional equipment, such as loading cranes and

SPMT's for shifting the salt frames, thereby saving time and money for the client.

The main challenge, aside from the sheer size and weight of the salt frames, was the area given for the assembly of the cranes. As this area was congested, some modifications were needed, including the removal of scaffolding pipes, the filling of manholes and the backfilling of concrete slabs along the area where the crane was parked. Through meticulous planning and a high-precision approach, AJHL's expert team were able to execute the lifts safely, successfully and in accordance with the client's schedule.

# SYNCHRONISED ACTIVITIES IN SINGAPORE, UAE, QATAR AND SAUDI ARABIA TO MEET INTERNATIONAL MILESTONES DURING GLOBAL PANDEMIC

**At the height of the ongoing COVID-19 pandemic, AJHL was faced with many logistical challenges due to the detrimental impact on supply chains, manpower and time constraints.**

Despite these unprecedented barriers our international teams were able to simultaneously execute multiple projects across the globe by successfully sharing resources and arranging the necessary permissions while adhering to all COVID-related regulatory requirements. This sequence of articles showcases a snapshot of some high-profile mega-loadouts and heavy lifting carried out in several locations simultaneously during the period which achieved multiple historic milestones in the process.

## HISTORIC ACHIEVEMENT IN SINGAPORE

For example, the Singapore AJHL branch, in alliance with other AJHL branches, was able to complete the largest module loadout in the company's and the client's history. Furthermore, the super-sized loadout of two topside substation structures destined for a wind farm in the North Sea, including a 9,000 and 2,500 tonne module from an integrated yard facility, was the largest-ever carried out in the region by some margin.

AJHL were assigned with the vessel management scope, including mooring arrangements for the client-supplied heavy lift vessel at the loadout position alongside the jetty; picking up the two modules based upon AJHL engineering studies by utilising 368 axle lines of AJHL's Self Propelled Modular Trailers (SPMTs) and 16 power pack units. AJHL designed two heavy transportation beams with capacity of 2500 te each. Each module was transported using separate SPMT configurations and set down on the ships deck by using SPMT hydraulic system. To perform the loadout of the 9,000te module AJHL engineers designed all the required customised structures including load spreading mats. The loadout operations also included vessel management and supply of mooring accessories, for example, mooring ropes and winches.


Each of the three projects had a contingency plan which involved detailed risk assessment and mitigation procedures in case of any eventuality. Ensuring AJHL was confident they could achieve the desired results under any circumstances.

The largest module weighed the equivalent of 60 blue whales!

It was essential to coordinate closely with the client, authorities and stakeholders in order to manage the international mobilisation of AJHL resources from various countries to execute the timely load-out for the client, as well as protect the health of the AJHL and client teams from COVID-19. Safety protocols included strict adherence to government quarantine on arrival rules, electronic monitoring of personnel movements during the project and use of separate accommodation facilities to minimise the risk of virus transmission.

The scope of work was achieved safely, successfully and on time despite the significant supply chain and manpower challenges presented by the global pandemic including contactless operations and the mandatory zero-incident requirement by the client – demonstrating exceptional resilience, consistency and expertise by the AJHL team. The timelines were met, thanks to impeccable, integrated planning, detailed engineering and by following strict risk assessment processes which were shared with all stakeholders on a daily basis prior to each phase of the load-outs.

## ABOVE AND BEYOND IN THE UAE

Meanwhile, over 3,000km away in the UAE, the AJHL team were in the execution phase of their contract for the loadout of 30 vertical turbine jackets and 90 suction caissons, destined for a renewable energy project in Europe, which involved building and installing 114 wind turbine generators.

Timing was crucial to the success of the operation and AJHL performed exceptionally well, completing all tasks safely and successfully, despite the logistical barriers presented by the ongoing COVID-19 pandemic.

This was even more of an achievement given the nature of the operations; with each jacket weighing 2,100 Te, Self Propelled Modular Trailers (SPMT) were used for the execution. Clearance between the heavy lift vessel grillages and the SPMTs was millimetre tight, making pinpoint accuracy necessary for transportation and re-positioning. AJHL had to transport the jackets from a storage location that was 1km from the heavy lift loadout vessel. Furthermore, the onsite pathway was obstructed by working cranes and the delivery sequence was also very challenging, with the middle-most jacket assigned for loadout obstructed by other vertical jackets and large fabrications to the front and rear.

Nevertheless, thanks to cutting-edge equipment and focus on planning, the team was able to work seamlessly to bring this project to life by maintaining consistent communication with the client and the loadout of five jackets was successfully performed in 3 days.

The team went above and beyond in order to exceed the client's expectations – even removing traffic lights and building new temporary access routes based upon AJHL route surveys for transportation of the massive sections through the busy port area.

Between the load-out activities, AJHL was requested to carry out the upending and installation of suction buckets. The team managed their time efficiently, completing all activities well ahead of the target time frame of 10 days. Crucially, the scope was carried out in accordance with COVID-19 safety measures, including daily temperature checks on personnel and social distancing to ensure, as far as possible, the protection of everyone involved from the consequences of COVID-19.



## A FIRST IN QATAR

Even further afield, another historic milestone was simultaneously being achieved in Qatar, where a leading national EPC contractor in Qatar tasked AJHL with the weighing and loadout of a 2,180-tonne wellhead platform jacket (WHP12N), notable for being the first of its kind ever fabricated entirely in Qatar.

A team of 20 AJHL employees were mobilised to provide additional project management, engineering and operational services to the client as a supplement to the resident AJHL branch team. Once again, the COVID-19 pandemic presented a number of logistical challenges such as social distancing measures that the team were able to overcome. The project was completed on schedule and in accordance with the highest safety standards.

The WHP12N jacket was designed to support a topside module for the North Field Production Sustainability (NFPS) project in Qatar. AJHL's extensive scope of work included the weighing and transportation of the jacket as well as managing, mooring and ballasting a 300-class barge supplied by the client.

The first and heaviest challenge of the project was the grillage construction phase, which was scheduled for the end of the fabrication period and needed to be developed in accordance with the load-out schedule. This was a crucial period during which the AJHL team worked closely with the client to help them adhere to essential timelines and provide support wherever possible.

Despite postponement of operations by the client due to strong winds and sandstorms, the project was ultimately carried out in a safe and timely manner, in alignment with the client's schedule and adhering to COVID-related precautionary measures.

As part of the excellent support provided, the AJHL team collaborated with the client to recommend the optimal transport routes requiring minimal preparatory arrangements, as well as providing vessel management services including ballasting and loadout plates. By working closely with the client from the early planning stages, the AJHL team were able to develop the elements and methodology needed to exceed the project specifications and client expectations.

> Despite unprecedented barriers caused by COVID 19, the team were able to manage multiple challenging projects across the globe simultaneously by successfully sharing resources and working closely with the authorities to navigate the pandemic regulations and protocols.

## REACHING THE SKIES SAUDI ARABIA

The AJHL team is very proud to have been simultaneously engaged for a milestone project in the context of Saudi Arabia's clean energy goals: the installation of one of the world's largest demountable flare systems, as part of a major refinery expansion project. The refinery is part of a $2.6bn clean fuel refinery project and is run by one of the world's leading producers of energy.

The flare derrick structure in question presented a challenge due to its sheer size; with a triangular base of 40x40x40m and top of 28x28x28m, equipped with eight risers measuring 200m in height from the ground and weighing a total of 1,480 tonnes.

Calling on their extensive lifting and installation experience, the AJHL team determined that the best solution was to use one of their Demag 8800-1 crawler cranes in TWIN configuration. This 3,200te-capacity crawler crane was ideally suited to the job at hand, not only because of its minimal footprint but also due to its significant impact in reducing the overall project schedule, which was a key requirement made by the General Authority of Aviation, given the location in an air traffic zone.

Weighing 1,489 tonnes, the 200m-tall derrick was pre-assembled into eight modules, each around 25m in height, to be completed within 10 lifts.

Weather conditions presented a major challenge as the site was located within a high wind exposed area. Therefore, the AJHL team collaborated closely with the client to develop documentation in accordance with AJHL QHSE systems including detailed risk assessment and mitigation procedures in order to have comprehensive contingency plans in place to respond to any unexpected significant changes in forecasted weather conditions.

Regular evaluations ensured that the team were able to work safely and with no disruptions to the project schedule.

The Kingdom is currently working towards the clean energy goals of Saudi Vision 2030, which includes aiming to have 50% of its energy generated from renewable sources by 2030. AJHL is very proud to have played an important role in supporting this ambition.

# BUILDING ICONS
# FIFA 2022 QATAR

**With the FIFA World Cup 2022™ in Qatar fast approaching, AJHL was contracted for two prestigious venue projects for the global event: Lusail Stadium and Ahmad Bin Ali Stadium.**

## LUSAIL STADIUM

The AJHL team were tasked with defining, managing and implementing the lifting and installation operations for the Lusail Stadium, for which the design is inspired by intricate decorative motifs which are a mainstay of art and design in the Arab and Islamic world. This presented a unique challenge due to the very heavy and complex structures to be lifted.

Almost all of the 48 V-frames and 24 compression rings were of different sizes and therefore, the lifting and installation needed to be safely carried out using bespoke resources in full compliance with Qatar regulations and UK BS7121.

Thanks to their industry expertise, the AJHL engineering team were able to propose innovative lifting methodology and resources, given that conventional methods were inadequate to meet the challenges of this project.

The lifting required variable lengths of lifting tackle during different stages of the operation, especially for the final installation and also whilst aligning the V-frames and compression rings with the foundation.

Initially, the client scope required the precise alignment of the load to the foundations; using multiple cranes to make the V-frame vertical for lifting into place after being fabricated horizontally. However, the AJHL engineering team succeeded in removing the tandem lifts requirement by proposing strand jack systems integrated into the lifting tackle arrangements in order to accommodate the variable tackle length requirements and ensure adequate capacity to handle the minimum and maximum loads within the overall 15,000 tonnes of steel to be erected during the 10-month operation. The client was delighted with this proposal as it was very cost effective and time saving.

Due to the magnitude of this project and the complex schedule of activities, AJHL assembled a highly experienced team of 55 professionals from within its local workforce to execute the works.

Moreover, it was imperative that the AJHL lifting team, strand jack team and transporting team were consistently in contact with each other and the client to ensure that the operations were fully synchronized. Thanks to this impeccable collaboration, each of the 72 heavy lifts were planned and accomplished safely on schedule.

### AHMAD BIN ALI STADIUM, A SYMBOL OF CULTURE

AJHL was also chosen for the construction of Ahmad Bin Ali Stadium, a 40,000-seat capacity facility, built to host world-class sporting events, including the FIFA World Cup 2022™.

The client selected AJHL for this project because of their extensive industry experience and reputation for overcoming complex engineering challenges, as well as being able to meet the potential requirement of large fleets of heavy lifting and transportation equipment. The scope of work was to install modular steel roof trusses, to be fabricated on-site, weighing up to 195 tonnes with dimensions of up to 75m in length and 17m in height.

In order to minimise disruption to the other contractors at site, the scope of works required a crawler crane of sufficient capacity to travel around the outskirts of the stadium and complete the installation from radii up to 80m and elevations up to 40m. To meet these requirements, AJHL used a Demag CC8800 (1,250te) crane in SWSL configuration with 54m main boom and 60m luffing jib. In total, around 40 cranes of various capacities were deployed to complete the construction of the stadium in accordance with the client's time frame requirements.

Al Rayyan, where Ahmad Bin Ali Stadium is located, is known for its love of traditions and local culture, as well as its hugely popular football team, Al Rayyan Sports Club.

As in the case of the Lusail Stadium, the Ahmad Bin Ali Stadium also boasts cultural design touches inspired by the region. The standout was the very intricate, fragile but heavy façade incorporating multiple symbols of Qatari culture, including a depiction of sand dunes in the local desert.

AJHL ensured that every step of the scope, from planning to execution, was completed according to the highest regulatory standards. As a result, the construction of both stadiums was an operational and engineering success for AJHL and they were completed well within the required time frame and with zero LTI. We are very proud to have had the opportunity to participate in the creation of these two iconic Qatar landmarks.



# SUCCESS AGAINST THE ODDS AUSTRALIA

**AJHL was approached by the client to partake in a challenging project – the loading from storage, transport to port, barging, offloading from barge, transportation to site and installation of replacement compressor modules in a live gas plant, all safely and without disrupting the plant, part of critical national gas supply infrastructure.**

The AJHL team successfully and safely completed the loadout of the modules at a gas processing plant on Varanus Island, approximately 75km offshore from Western Australia. The project required coordination with, and support from, multiple EPC contractors.

The global coronavirus pandemic brought many additional challenges to the project, which were coordinated and managed diligently by the AJHL team, thus ensuring that all government safety requirements were met.

A detailed task risk analysis was formulated and executed, following coordination with and approval of the client. The scope was carried out in full compliance with the new stringent government COVID-19 safety protocols. When the client halted the loadout work because of the pandemic, the modules were unloaded and the trailers were demobilised as the site was locked down. When work recommenced, the schedule for offloading the modules had to be adapted as determined by the varying 7m tides. The modules, each weighing between 200 and 400 tonnes, were loaded by SPMTs from the wharf to the barge in Perth. All equipment was subject to strict quarantine and maintenance checks prior to unloading in the Class A reserve waters of Varanus Island.

The AJHL team are particularly proud to have met the client's milestones and seamlessly adapted to the changes of COVID19-driven directives, meeting all deadlines, on budget and without incident.

The AJHL team provided the requisite high degree of engineering knowledge to plan with precision every stage of the project, being execution of the heavy transport from laydown, to barge, then to plant for old module removal and new module installation.

# DELIVERING POWER TO THE DESERT UAE

**AJHL used their industry expertise and experience to successfully manage the complex logistics of a heavy transportation project to a remote desert area in the Western Region of the UAE.**

The project involved the transportation of Electrical Technical Room (ETR) and Instrument Technical Room (ITR) modules from the client's facility in the Industrial Area approximately 30km to the site location in the middle of the desert, and the installation of the modules on the foundations by means of jacking and skidding.

Initially, the client planned to install the modules using a crane. However, after studying the documents and visiting the site, AJHL's engineering team suggested the use of jacking instead. This not only saved the client significant time and costs in ground preparation and equipment but also meant the job could be completed much more quickly, safely and easily.

The cargo weighed an impressive 118.3 tonnes with a length of 24.93m and a width of almost 6.2m. The transportation of the ETR skids was carried out using 15 axle lines of conventional hydraulic modular trailers and the ITR skids were transported using a low bed trailer.

> The main challenge was the secluded desert location of the site, the roads to which were covered in sand due to changing wind conditions.

The installation of the modules was carried out with millimetre precision using four 125te jacks, each connected to a power pack unit. The main challenge was the secluded desert location of the site, the roads to which were covered in sand due to changing wind conditions. This necessitated constant weather monitoring and planning and required the use of two simultaneously driven prime movers to ensure sufficient power availability to navigate the undulations of the sand dunes.

AJHL demonstrated their knowledge and experience through meticulous planning and preparation of the transportation, focussing on the practical applications for efficient implementation. A total of 14 personnel were involved in different capacities to combine the AJHL team's skills and capabilities and ensure the safe and successful completion of the project, in accordance with the client's timelines.



# STAYING COOL UNDER PRESSURE SAUDI ARABIA

AJHL played a crucial role in restoring equipment when a fire broke out at one of the world's largest crude oil stabilisation facilities, located in eastern Saudi Arabia.

AJHL were among the on-site teams called out at short notice to assist after a number of explosions rocked one of the Kingdom's oldest processing plants. There were 16 infernos within close proximity of three out of the 14 processing facilities, presenting a huge threat to on-site personnel, as well as to the buildings and materials.

The impact on the facilities disrupted around half of the country's daily production of oil and gas, which is the equivalent of 5% of the global oil production and around 2 billion cubic feet of natural gas per day. As a result of the fire damage, the plant had to be completely shut down for the first time in its 71-year history.

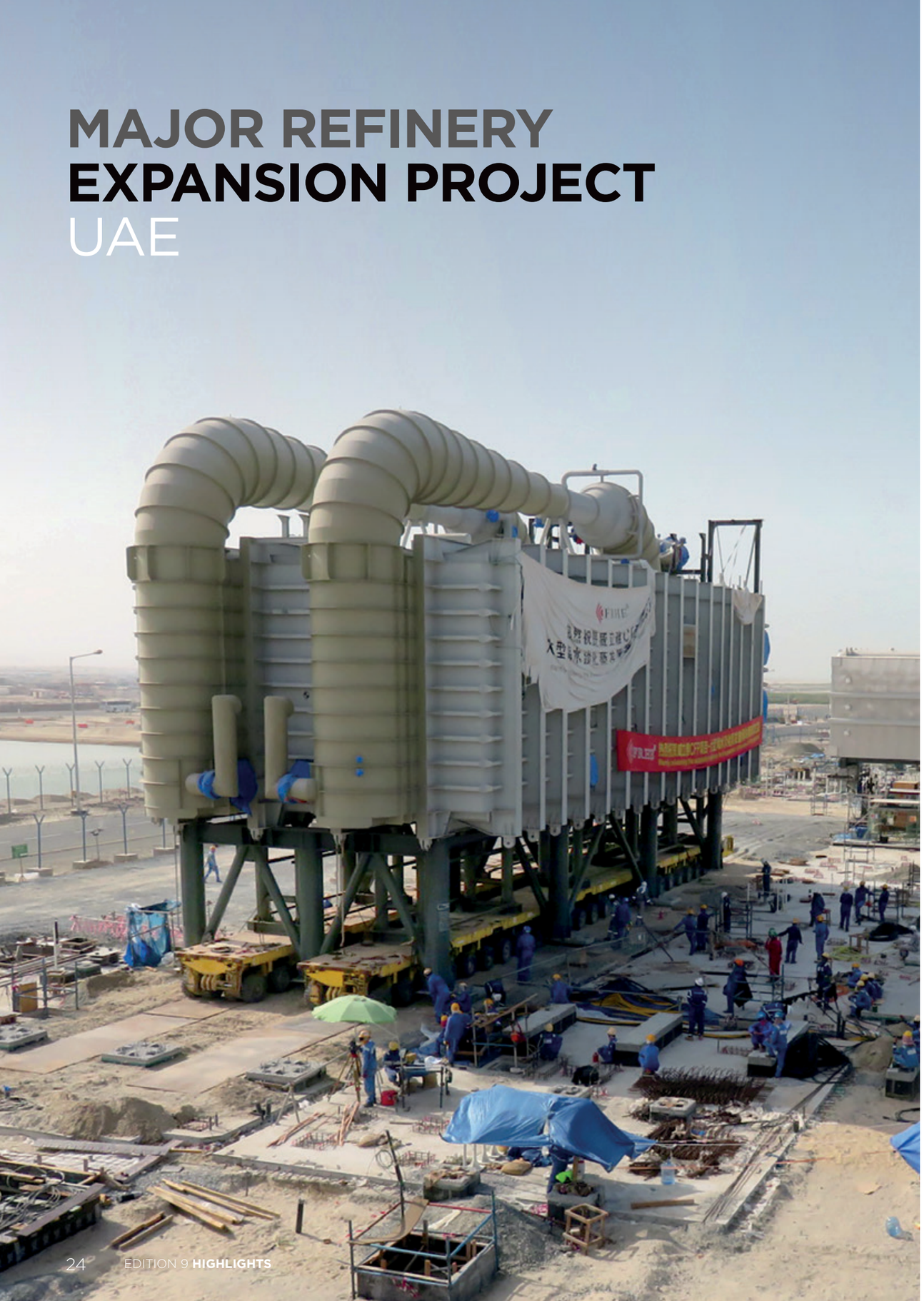
The AJHL team's considerable expertise in engineering and planning was needed to help with the challenging task of restoring the plant's equipment. Not only were time constraints tight, but the area was also congested and the damaged material needed to be carefully assessed prior to lifting because its integrity had been changed by the fire. Furthermore, these tasks needed to be carried out to the highest international safety standards in the shortest possible time.

The AJHL team showed exceptional professionalism and motivation under the challenging circumstances, working tirelessly in split day and night shifts to carry out the operations successfully and without incident. Among the equipment deployed were a Liebherr LR1750 because of its versatility. Collaboration was key as multiple subcontractors were called in to support the process which involved removal of more than 50 items weighing up to 90 tonnes.

The client was very impressed by AJHL's resilient mindset and ability to complete this operation while facing tremendous pressure under physically and mentally challenging conditions. The team's commitment to AJHL's standard documentation and QHSE protocols, unwavering courage in the face of danger and adversity and the flawless emergency response of everyone involved ensured the safety of all.

Source ARAMCO

# MAJOR REFINERY EXPANSION PROJECT UAE



**AJHL played a significant role in the Crude Flexibility Project, which expanded a key oil refinery in Ruwais, Abu Dhabi, as part of the client's programme to accelerate its downstream strategy ultimately increasing the plant's refining capacity and crude types by up to 50 additional grades of fuel and its production capacity by 420,000bpd.**

## PART 1 – INNOVATIVE TRANSPORT SOLUTIONS

This upgrade included building new facilities and modifying existing installations to process offshore crude at the Ruwais Refinery.

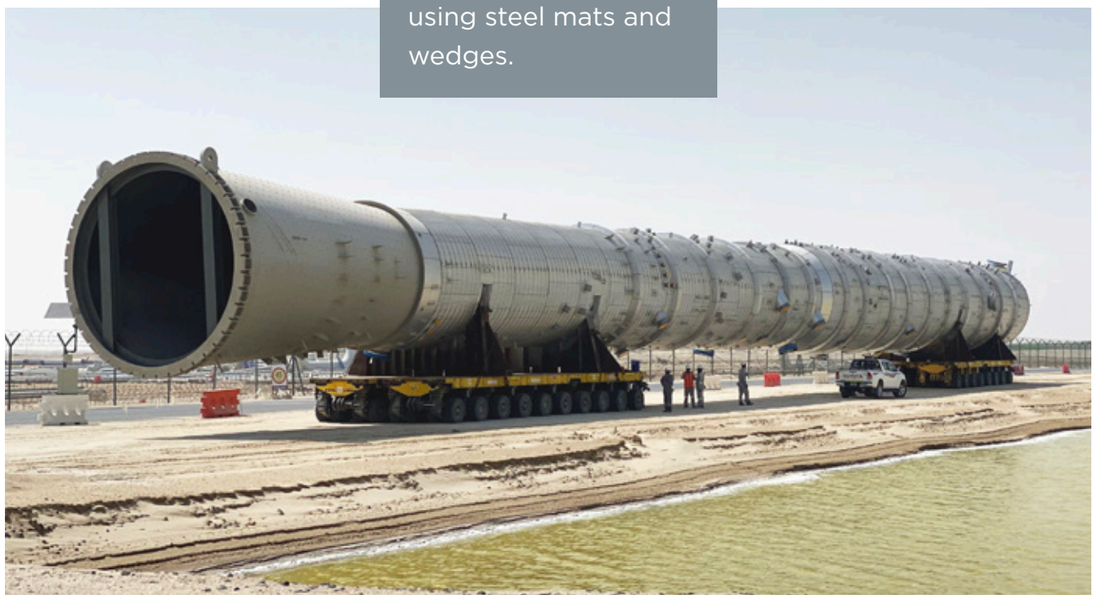
The scope of works awarded to AJHL included three main elements – transportation, lifting, jacking & skidding which are outlined separately in the upcoming pages of this publication.

The transportation element included 190 items of heavy cargo weighing up to 604Te and ranging from reactors, fractionators, vessels and heat exchangers.

AJHL utilised 216 Self Propelled Modular Trailers (SPMT) axle lines, eight power packs, two 250te turntables, 30 axle lines of conventional hydraulic modular trailers with two prime movers, and more than 240 stools and beams. A number of significant challenges arose, but AJHL were always able to provide safe, comprehensive and timely solutions. The main obstacle was the loadout of the pipe rack (PAR) modules, as the client's requirement was for a conventional jetty with a ramp, yet the jetty available was a roll-on, roll-off (RoRo) type. The AJHL engineering team devised an ingenious solution to temporarily convert the RoRo jetty into a conventional jetty using steel mats and wedges. The solution also ensured that, after transportation, the jetty was easily restored to its original format. Another significant challenge was the transportation and installation of the Multi Effect Distillation Evaporator (weight: 540te, L: 36.3m x W: 12.9m x H: 17.3m) using SPMTs. The excessive dimensions of this item of cargo required modification of the high voltage electricity lines, trimming the trees along the road as well as the removal of light poles and fences to ensure safe transportation. Also, to overcome the challenge of transporting two product fractionators (weight: 317Te, L: 79.6m x W: 6.2m x H: 6.2m) along a narrow route, the team utilised two 250te turntables to minimise the requirement for major modifications to the route.

> The engineering team devised an ingenious solution to convert the RoRo jetty into a conventional jetty using steel mats and wedges.

Overall, this project required a high level of expertise, flexibility and skill to ensure its safe and timely execution particularly to overcome the significant challenges presented by the ongoing corona virus pandemic.



# PART 2 – LIFTING WITHOUT COMPROMISE

**The lifting element of the work scope for this project required an expert team of some 120 personnel at peak to provide sufficient management, engineering and operational personnel to install the wide range of heavy equipment weighing up to 609te.**

The fleet of crawler cranes deployed for this part included a Demag CC8800-1 (1,600te), Demag CC2800-1 (600te), Demag CC2500-1 (500te), Demag CC2500 (450te), Demag CC2400-1 (400te), Hitachi SCX2800-2 (275te) and the mobile cranes included the Demag AC650 (650te) and Demag AC500- 2 (500te) together with additional cranes for support and ancillary activities.

The most challenging aspect of this part of the project was that the reactors were required to be installed within the existing live plant area which was in continuous operation. As a result, the lifting area was extremely congested and site modifications such as the removal of pipes and the filling of manholes were simply not possible. Nevertheless, AJHL was able to plan the positioning of the cranes with pin point accuracy to ensure that the lifts were completed safely.

Furthermore, with safety always a top priority for AJHL, extreme safety precautions were taken throughout the scope of the project inside the live plant, including the deployment of hydrosulphide detectors and emergency escape breathing apparatus (EEBA). Throughout the project, AJHL demonstrated exceptional capabilities in terms of their equipment fleet and operational manpower, in accordance with the client's very high site standards and stringently applied deadlines.

## PART 3 – PUSH UP AND POSITIONING TO PERFECTION

AJHL's work on the Crude Flexibility Project culminated in the jacking up of 27 pipe rack modules in a temporary storage area, transportation to the installation location and final positioning into place with millimetre precision.

Jacking was considered the optimum methodology as each module had 12 jacking points and was constrained by extremely tight spacing available at the installation area. Enerpac EVO Synchronous BLS-2006 systems mounted upon SPMTs were deployed for the jacking requirements. These comprised twelve 200te synchronous jacks coupled with T-Blocks to attain the required height.

AJHL deployed their state-of –the-art Scheuerle split SPMT axles for moving the pipe racks from their jacking position to the installation location. Since the space between the foundations was only 5 metres, in order to achieve safe movement with optimum stability, the utilisation of three file SPMTs was essential.

AJHL operators deployed the control systems to ensure the successful installation of the PAR modules to millimetre accuracy thereby comprehensively fulfilling the scope of work and meeting the client's expectations.

> The team came up with a cost-effective solution: using tower crane sections combined with mats and stools to attain the multiple predetermined heights required for the installation of the modules.

# INGENIOUS MANOEUVRE
## UAE

**AJHL was contracted by a client that operates one of the most established shipyards in the Gulf to transport a 275 te dredger from its yard and install it at its destination in the desert.** The scope of the project included not only transportation, but also obtaining the necessary permissions from various government departments.

This presented a challenge as, due to the oversized dimensions of the dredger (34.75m in length, 9.15 metres in width), several authorities had to be involved to obtain permissions for the removal of several obstacles such as street lights and signboards in order to facilitate the appropriate abnormal load trailer combination to ensure the safety of the route.

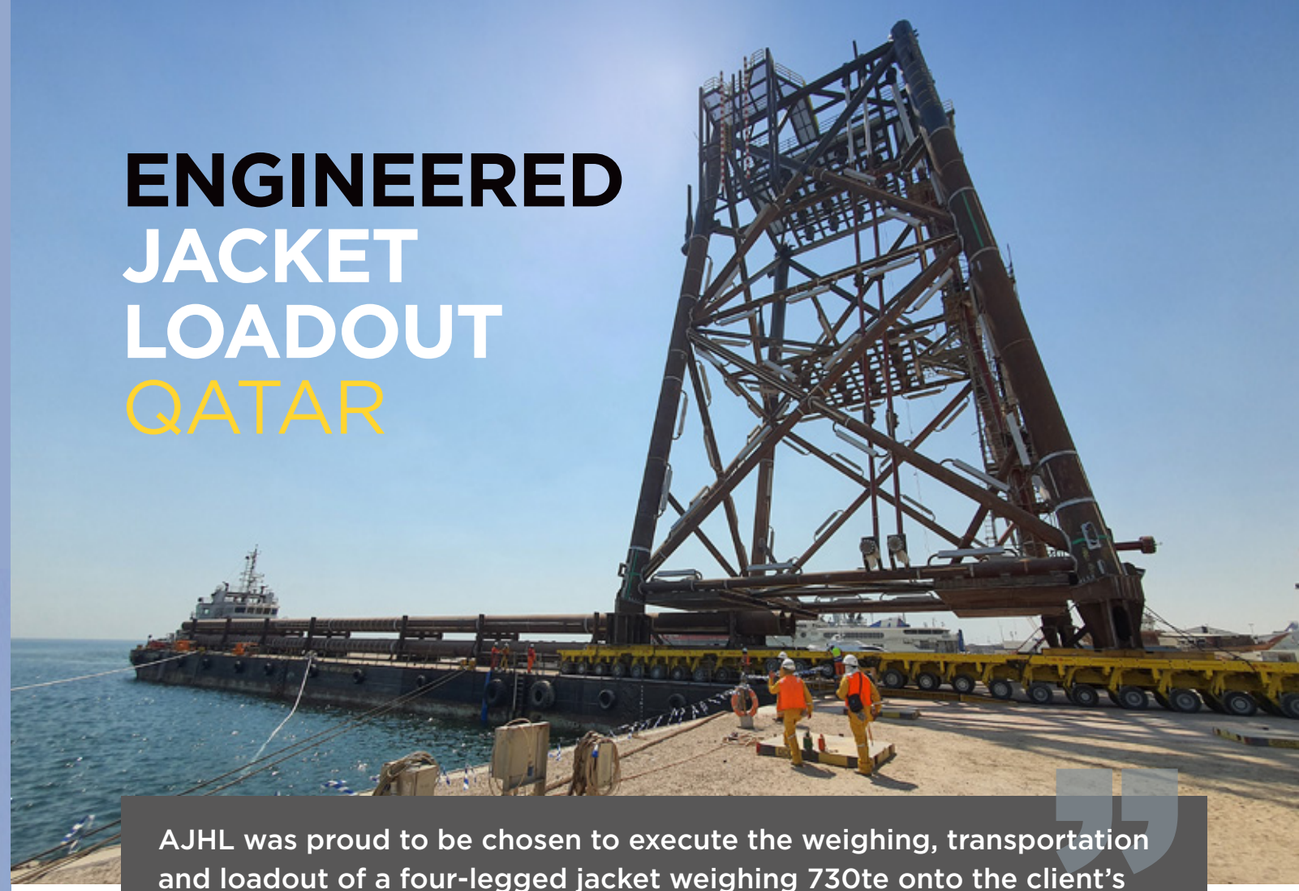
AJHL was able to secure all the necessary government permissions and overcome the more challenging aspects of the route. For example, at one location where the abnormal load size meant that the combination could not navigate the turn, the team proposed parking the entire combination. The prime mover was then disconnected from the front and re-attached at the opposite end, effectively flipping the combination by 180 degrees and eradicating the need for the physical turning of the trailer and load. This was just one example of the ingenuity and skill that AJHL employed during the project.

For the transportation, AJHL used 21 axle lines of conventional hydraulic modular trailers and a prime mover with 609 BHP Mercedes engine. The lifting was carried out using two superlift crawler cranes: a Demag CC3800-1 (650te) and a Demag CC2500-1 (500te). AJHL's involvement from the outset meant that the client was provided with a complete package solution, from the loading of the dredger at their yard to the final lowering at its final destination. This contributed significantly to the timely and successful delivery of the project, with the transportation completed in just two consecutive nights.

Ten AJHL experts were involved, including a transport supervisor, lifting supervisor, crane operators, transport assistants and riggers. The safe transportation of the giant dredger, along with the navigation of the loads through narrow streets and the removal and modification of obstacles along the route, was a huge achievement and AJHL feel very proud to have been called upon to demonstrate its skills once again to this prestigious client.



# ENGINEERED JACKET LOADOUT
## QATAR



AJHL was proud to be chosen to execute the weighing, transportation and loadout of a four-legged jacket weighing 730te onto the client's 300-class barge for the North Field Expansion Project.

The North Field Expansion (NFE) development plan includes six mega liquefied natural gas (LNG) trains, which will ramp up Qatar's liquefaction capacity from 77 million tonnes per annum (mtpa) to 126 mtpa, an approximately 64% production increase, by 2027.

Qatar is the largest global exporter of LNG and the country's exports of LNG, crude oil and petroleum products constitute the majority of government revenues.

Throughout this loadout project which included vessel management, ballasting and mooring arrangements, the AJHL team was proactive and meticulous when it came to overcoming obstacles.

The weighing operation was carried out using 8 Enerpac BLS20006 jacks operated by the Enerpac EVO system powerpack with supporting steel structures to distribute the load safely onto the ground.

The most critical aspect of the operation was the transportation and loadout of a 40m high vertical jacket weighing 730te in a challenging longitudinal direction. This was carried out using two sets of 24 axle lines of SPMT, assisted by ten 400te/cu.m ballast pumps, two mooring winches and four sets of robust loadout ramps. The AJHL engineering team performed mooring calculations with respect to the jetty conditions and other operational parameters. Based on the positions and weight of the jacket, a highly detailed ballast calculation was prepared by the AJHL marine engineering team which was implemented by the AJHL operational teams in the field to achieve a safe, smooth and steady loadout operation.

Prior to the loadout, the AJHL team collaborated closely with the client to recommend the optimum transport route which required minimal adjustments.

The team was able to safely complete all the tasks within the client's schedule, despite site delays caused by strong winds and sandstorms.

To ensure the quality of the project and the satisfaction of the client, AJHL deployed a full project management team including engineering and supervisory personnel to guide and coordinate the field activities of the field operatives.

Throughout the project, AJHL liaised with the client effectively and exceeded expectations which was an even more impressive achievement given that the work scope was carried out during the COVID-19 pandemic which required strict adherence to all related safety measures including social distancing and other regulatory pandemic requirements.

We are delighted that, thanks to the proactive approach by the AJHL site team, the project was completed safely and successfully on time to the client's full satisfaction.

# FLOATING VILLAS UAE

AJHL was proud to be the heavy lifting and transportation contractor for a unique and prestigious UAE project involving the building of islands on Dubai's coast.

The expert engineering and operational teams were proactive in addressing the unique challenges of the project that, once completed, will house private holiday homes, apartment buildings, hotels, floating palaces and a range of retail, entertainment and F&B outlets. These floating luxury villas will be the world's first providing underwater views. AJHL were tasked with a scope of works which included the jacking of floating villas onto a suitable transporter, taking them to the lifting location where the AJHL crane would lower them into the water.

The villas did not have lifting points. Nevertheless, the AJHL engineering team were able to overcome this challenge by designing a lifting frame that was light and cost-efficient, with a safe working load of 350 tonnes and a self-weight of only 9 tonnes but allowing the complete on hook weight to be supported stress free during lifting. Initially, the villas were jacked up using four 125te jacks up to a height of 1.3 metres. Self-Propelled Modular Trailers (SPMTs) of 2x12 axle line combinations were used to transport the villas safely. At the lifting location, a Demag CC2800-1 (600te) crawler crane was used to lift the villa on the lifting frame, together a total of 315 tonnes, and lower the villa into the water.

This was a uniquely challenging project, with no precedent to guide the lifting and transportation for these first-of-their-kind floating villas. However, AJHL's successful delivery of the project scope demonstrated the team's ability to be proactive and collaborative. The AJHL centralised engineering support department helped to serve the clients' team consistently throughout the project while maintaining the highest safety standards. In combination, the engineering and operations teams were able to think creatively, strategise effectively and overcome the logistical challenges with their joint bespoke solutions.

# FERTILISING GROWTH SAUDI ARABIA

AJHL successfully and safely completed the scope of work to develop a large scale phosphate complex in the eastern province of Saudi Arabia.

The project is expected to add three million tonnes of production capacity by 2024 and create 7,000 direct and indirect jobs, cementing the client's status as a world-class phosphate producer on the global stage.

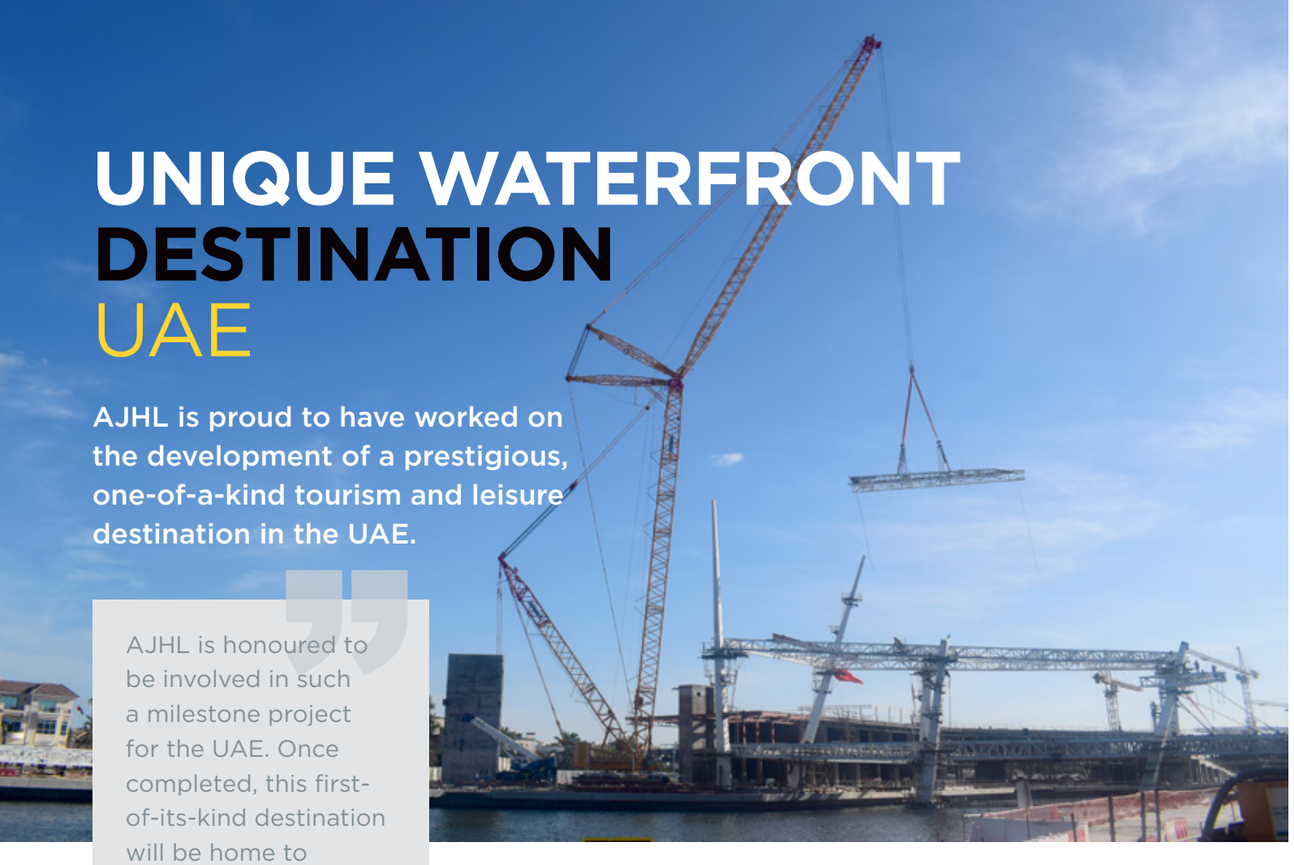
The AJHL team had the relevant experience needed, having previously worked on a number of similar projects in the Kingdom. In order to deliver the scope of works, which involved the installation of 54 items of heavy equipment, each weighing from 50te to 600te, AJHL provided a range of crawler cranes including a Demag CC 8800 (1,250Te), Liebherr LR 1750 (750Te), Demag CC 2800-1 (600Te), Hitachi SCX 2500 (250Te) and a mobile crane, a Demag AC 160 (160Te).

One of the key requirements was to plan and execute the lifting of a CO2 absorber which weighed 590te and measured 52m in length. AJHL used a 1250Te Demag CC 8800 crane in 78m SSL configuration and the vessel was tailed using a 750Te Liebherr LR 1750. Due to a winning combination of meticulous planning, communication within the AJHL team and collaboration with the client, AJHL were able to complete the project safely, successfully and on schedule.

The AJHL team is delighted to have worked on this additional milestone that will support Saudi Arabia's Vision 2030 to diversify its energy and amplify the Kingdom's competitive advantage.

> The project is expected to add three million tonnes of production capacity by 2024 and create 7,000 direct and indirect jobs.

# UNIQUE WATERFRONT DESTINATION UAE



**AJHL is proud to have worked on the development of a prestigious, one-of-a-kind tourism and leisure destination in the UAE.**

> AJHL is honoured to be involved in such a milestone project for the UAE. Once completed, this first-of-its-kind destination will be home to seven districts and its attractions will include Abu Dhabi's first standalone-cinema, a national aquarium, and walking and cycling areas.

With an area covering 150,000 square metres and over 2.4km of waterfront, once completed, this unique destination will redefine social dining and entertainment in Abu Dhabi and is projected to host up to one million visitors a year.

AJHL was tasked with the installation of bridge sections at four different locations. Those weighing up to 125 tonnes were required to be placed at a radius of 54m and those weighing 35 tonnes were placed at a radius of 110m.

The project location presented the team with a major challenge as, due to the close proximity to the airport and the subsequent height restrictions, a daily permit was needed to raise the booms in the air and all the lifting activity had to take into account the flight schedules.

However, despite the logistical challenges, AJHL was able to successfully meet the project requirements in a timely and safe manner. To complete the installation of the bridge sections, the team used a Demag CC3800-1 (650te) crawler crane and two mobile cranes: a Demag AC500-2 (500te) and a Demag AC250-1 (250te). The Demag CC3800-1, in particular, helped to streamline the process, in comparison to the initial method proposed by the client involving loading the bridge sections onto a barge and using a crane on a barge to place the bridge sections.

This was because the Demag CC3800-1 could be quickly rigged in various configurations including SSL/ LSL and SWSL, which made it possible to swiftly lift onto the opposite bank. Since the crane was onshore, the complexity and risk of the project were greatly reduced. As always, safety was the top priority of AJHL and the 10-strong team, in close liaison with the client, assembled the steel structure, steel columns and canopy for the project successfully and without incident. Moreover, a dedicated team of mechanics, technicians and electricians was on standby to immediately address any machinery maintenance and safety issues and assist in ensuring timely completion of the scope of works which was crucial to the client requirements.



# REACHING FOR NEW HEIGHTS LOYAL PERFORMANCE

Pakistani-born **Mohammad Ishaq** may have already marked his 30-year anniversary at AJHL, but it is unlikely to be his last major milestone within the heavy lifting industry.

**AJHL Lifting Supervisor, Mohammad has not only been a mentor figure to many of the employees he manages but also a visionary,** who has grown and evolved with the industry in which he has made his career.

A dedicated and tri-lingual (English, Arabic and Urdu) individual, Mohammad began his long deployment with AJHL as a coordinator at the Zirku Island oil field in the UAE. He subsequently worked his way up to become the Service Team Foreman at Al Jaber Establishment in Abu Dhabi, where he was responsible for the routine service arrangements of approximately 2,000 units of equipment, including cranes, earth-moving equipment, Kenworth prime movers and light vehicles. It was during this tenure that he developed a deeper understanding of the heavy lifting and transportation equipment and began to foster an interest in the application of the equipment in the field. From here, his responsibilities grew along with his certification achievements, as he rose from Site Foreman to Co-ordinator and into his current role as Lifting Supervisor, while also obtaining awards and certifications in equipment management, project training and safety procedures along the way.

At every step, Mohammad demonstrated his reliability and trustworthiness, as well as a first-class work ethic, and it is this tenacity and determination that has enabled him to work his way quickly up the AJHL career ladder. Crucially, he also used his knowledge and experience in developing the skills of AJHL technical operatives, enabling them to reach their full potential and moulding them into a competent and professional workforce. Mohammad has been a key team motivator with a vast wealth of experience and a leader who is able to enhance the skills of his teams to meet and exceed the expectations of clients, ensuring that they deliver a top-level performance on every project. AJHL are grateful for his significant and long-term contributions.

Al Jaber Heavy Lift

*Safely* onwards and upwards

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