



## Dorman Long Technology

### Technology for modular construction



Bridge Construction



Buildings/Structures



Refinery Construction



Offshore Construction



Heavy Lifting



Jacking Systems



Roof Erection



Power & Industrial



Erection Gantries





## Introduction

Dorman Long Technology offers the following main services:

- Heavy lifting & skidding equipment design & manufacture for sale or rental
- Construction consultant
- Site supervision of heavy lifting & skidding operations

for the modular construction of:

- **Bridges.** Including long span cable stay, arch & suspension bridges
- **Oil and gas:** Offshore structures, refinery heavy vessels, thruster replacement
- **Building Structures.** Including large roof structures for aircraft hangers and sports stadiums
- **Power and Industrial.** Blast furnaces, power stations & chemical plants

Our role on most projects is to develop solutions to construction problems, fully engineer these solutions and then to work with our customers to carry out the operations on site. We are happy to offer any combination of erection engineering, equipment supply/rental and site supervision services to suit the needs of each project.

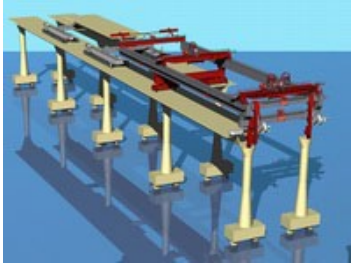
We design, develop and manufacture our own range of hydraulic lifting and skidding systems, including computer controlled strand jacks and climbing jacks, which are offered on a sale or rental basis. Please see our separate brochures for full details of all our products. In each case we will carefully evaluate the particular requirements of a project and recommend the most effective system to be used. All our jacking systems are inspected, serviced, tested and certified prior to each use.

We operate a quality management system which is accredited to ISO 9001:2008 a company health and safety management system which is accredited to OHSAS 18001:2007 and an environmental management system accredited to ISO 14001:2004. All systems have been written in-house by our own staff to ensure total relevance to our business.

This brochure gives brief details of many of the equipment we have supplied and the projects that we have undertaken. For further information on our products and our most recent projects please refer to our web site.



## Reference Projects - Bridge & Civil Construction



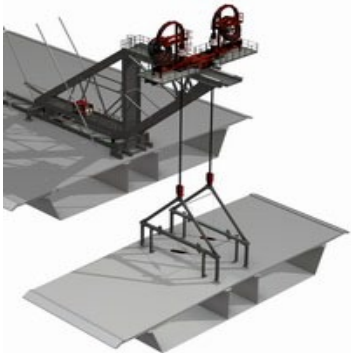
### Sheikh Jaber Al Ahmed Al Sabah Causeway Project – Doha Link, Kuwait

DLT are responsible for the detailed design of a bridge deck erection gantry, a transporter and a pair of straddle carriers for the Sheikh Jaber Al Ahmed Al Sabah Causeway Project – Doha Link, Kuwait. The Doha Link is a 12.43 km sea crossing with twin parallel decks and is constructed from precast concrete deck beams supported on cast in-situ piers. The straddle carriers, transporter and gantry were all designed to handle precast concrete bridge deck beams weighing up to 1700 tonnes and with a span range of 30m to 60 m.



### Riyadh Metro Project, Saudi Arabia

DLT are suppliers of 2 No 500 tonne capacity deck erection gantries, 2 No 500 tonne transporters and 2 No 260 tonne x 30m high straddle carriers to Main Contractor FAST Consortium. The system is designed to deliver and erect up to 1 span per day and has been designed to erect the bridge deck on a plan curvature of 1200m radius and to travel between erection positions over a bridge deck with plan curvature of 100m radius.



### Forth Replacement crossing, Scotland, UK.

DLT are appointed by the Main Contractor, Forth Crossing Bridge Constructors, as construction engineers for the launching of the North Approach Viaduct and for the design of the deck erection gantries for the cable stayed spans. The North Approach Viaduct launch section will be 221m long and weigh 4200 tonnes. It will be launched a distance of 233m. There will be 6 No deck erection gantries which will be used to erect a total of 109 steel/concrete deck sections weighing up to 729 tonnes at an erection rate of 1 section per gantry per week.



### Olmsted Locks & Dams project, Illinois, USA

The Olmsted Locks and Dams project consists of twin 110-foot wide by 1,200 foot long lock chambers on the Ohio river at Olmsted, Illinois. The lock chambers are constructed from heavy precast concrete units, that will be cast in a yard on shore and then handled on land using a purpose made gantry crane and in the water using a purpose made heavy lift catamaran barge. DLT were awarded the contract to design, supply and operate 2 No 12,000 tonne capacity computer controlled strand jack systems for use as the main lifting systems on both the gantry crane and the catamaran barge.



### Ponte Verde steel arch bridge launch, Italy

The 1000 tonne superstructure of the Ponte Verde steel arch bridge in Padua, Italy, was launched into place by Edimo Metallo S.p.A using Dorman Long DL-S185 strand jacks and with the assistance of our construction engineering and site supervision services. The complete arch bridge was fully assembled on site and then launched over the 90m span into final position, crossing 10 No railway lines that remained open throughout. Within the 90m span there were 2 No temporary supports for launching, located between the railway lines. 2 No DL-S185 strand jacks were used for pulling and a further 2 No DL-S185 strand jacks used to restrain the bridge from running away down the small slope and to allow the launch to be reversed in an emergency.



### E-Dong Cable Stayed Bridge, China

The E-Dong Cable Stayed Bridge is located in Huanggang city, Hubei Province, China, and crosses the Changjiang river. It has a main span of 926m and side spans of 275m, making it the third longest cable stayed bridge in the world. DLT were awarded the sub-contract by Second Highway Engineering Bureau to design a pair of 280 tonne capacity deck erection gantries to erect steel orthotropic deck segments weighing up to 369 tonnes each on one half of the main span.

## Reference Projects - Bridge & Civil Construction



### Rio Negro Cable stayed bridge, Brazil

The Ponte Sobre O Rio Negro is a 3505m long crossing of the Rio Negro in the heart of the Amazon rain forest, linking Manaus with Iranduba over the river Negro. DLT were awarded the contract to design, supply and operate 2 No 320 tonne capacity deck erection gantries to handle the 52 precast concrete deck sections of the cable stayed spans



### Honam High Speed rail, Korea. DL-SE35/1000 span erector

DLT are sub-contractors to Samsung C&T for design and supply of a DL-SE1000/35 span erection gantry for erecting the full length of section 4-1 on the Honam High Speed Railway project. The DL-SE1000/35 can erect precast spans weighing up to 1000 tonnes and up to 35m long at a rate of up to 2 spans per day and is self launching into the next span



### Infinity Footbridge, UK

The award winning Infinity footbridge is a 2-span tied arch crossing the river Tees in Stockton, England. Main span is 120m, side span is 60m. The arches are steel box sections and the deck is made from precast concrete segments that are post tensioned together to form the arch ties. DLT provided expert advice to the designers on erection methods and details for fabrication and buildability and provided full erection engineering to the contractor, including stage by stage analysis, aerodynamic response analysis and detailed design of all temporary works



### Sutong Cable Stayed Bridge, Deck Erection Gantries

With a main span of 1088m the Sutong Cable stayed bridge is the longest span cable stayed bridge in the world. DLT were sub-contractors to 2nd Navigation Engineering Bureau for the design and supply of eight deck erection gantries that were used to erect the 84 No. steel orthotropic deck segments, each weighing up to 450 tonnes.



### Orinoco River Second Crossing, Venezuela

At over 3km long and with two cable stay spans of 310m, this project provided many engineering challenges. The steel box girder deck for the 60m approach spans was launched in pre-assembled units of up to 2413 tonnes. The steel box girder deck of the two cable stay main spans was erected by balanced cantilever in 250 tonne segments. DLT were responsible for supply and operation of the strand jack systems for launching of the approach spans and for lifting and skidding of the main span deck units.



### Boyne Cable Stayed Bridge, Ireland

DLT were responsible for the design of the superstructure, as an alternative to the client's design, detailed design of the erection methods for all elements of the deck and for supply and operation of the strand jacking systems used to launch the deck into final position.



### Carquinez Suspension Bridge, California

DLT were responsible for all aspects of construction engineering for the bridge deck, main cables and hangers for this 728m span suspension bridge. We also undertook the sub-contract to erect the 24 No. 700 tonne steel deck units, which was carried out using strand jacks.



## Reference Projects - Bridge & Civil Construction



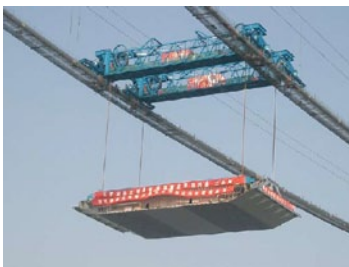
### Bishop's Bridge Replacement, Paddington Station, London

The existing three span masonry bridge and steel truss span which cross fifteen rail lines at the entrance to London's Paddington Station were replaced in 2006 with a new six lane composite bridge. The masonry spans were demolished and the 941 tonne truss bridge has lifted 9.8m to allow assembly and incremental launching of the new 2500 tonne bridge deck. DLT were responsible for conceptual and detailed design of all construction methods and supply and operation of all jacking systems for the lifting and launching operations, all of which took place within limited railway possessions.



### Tuti Suspension Bridge, Khartoum

DLT were responsible for the permanent works design and erection engineering for this landmark structure in the centre of Khartoum. The bridge has a main span of 210m and has been designed for construction by local labour.



### Runyang Suspension Bridge, China

DLT were responsible for the design, supply and commissioning of 4 No. 370 tonne capacity deck erection gantries for this 1490m main span suspension bridge. These gantries walk the main cables and work in pairs to erect steel deck units weighing up to 470 tonnes each. The gantries can be self erected onto the main cables and are easily adapted for future projects with different cable centres and diameter.



### Sheikh Khalifa Bin Salman Causeway Bridge, Bahrain

DLT were responsible for erection engineering of the bridge steel structure, involving offsite assembly of the 3000 tonne main span, transport to site and lifting in one piece into final position using 8 No. 500 tonne capacity strand jacks.



### Jiangyin Suspension Bridge, China

DLT were responsible for detailed erection engineering, heavy lifting equipment supply and site supervision for deck erection on this 1385m main span suspension bridge.



### Tsing Ma Suspension Bridge, Hong Kong

DLT were responsible for detailed erection engineering, heavy lifting equipment supply and site supervision for deck erection on this 1377m main span suspension bridge.

## Reference Projects – Offshore



### 4 x 5000 te & 4 x 3750 te float over jacking systems

DLT were awarded the contract by Swiber Offshore Construction Services to design and supply two synchronized hydraulic jacking systems for use in the float over installation of the 13,400 tonne process platform (AP) and the 8,000 tonne living quarter platform (AQ) for ONGC's B193 oil/gas process complex in the Arabian Sea, located 75 km offshore from Mumbai in a water depth of 70m. The systems have been designed with multiple rams at each support point to provide redundancy and ease transport and handling for maximum safety and flexibility for future use. Each system uses four hydraulic power packs and has a central computer control system for accurate synchronisation and full data logging of the operations. The systems have a lifting speed of 70 mm/min and a lowering speed of 1000 mm/min.



### 3600 MT weighing system for PTSC, Vietnam

DLT supplied 3600 tonne capacity computer controlled weighing system to Petro Vietnam Technical Services Corporation (PTSC) through Phong Viet. The system consists of 4 No 600 tonnes DL-WJ600 and 4 No 300 tonnes DL-WJ300 weighing jacks, all synchronised, controlled and operated by a single operator using our proven DL-P40 computer control system. The jacks were provided with load cells and the overall accuracy of the system was less than 0.5%. Our Engineer provided training and certified PTSC personnel on Operation and Maintenance of the system. The first operation for the weighing of PTSC MC Golden Lion Jacket was successfully carried out in the presence of DLT Engineer in April 2014 at PTSC offshore yard, Vietnam. Trained PTSC Personnel were able to use the system themselves to carry out the second operation in May 2014.



### 2 x 1000 tonne jacket load out and offshore pushing system

DLT are designers and suppliers of a 2 x 1000 te capacity (push/pull) jacking system to Nippon Steel in Japan for use on their offshore jacket installation barge. The jacking system comprises 2 No DL-GP1000 gripper jacks and has been designed to walk along a purpose designed skid track with anchorage slots at 1.25m centres. It is used for load out of jackets onto the installation barge and for pushing the jackets off the barge at the installation site. It has a hydraulic load balancing system to distribute the anchor force equally to four slotted holes to reduce the cost of the skid track. The first operation has been carried out successfully in Malaysian waters.



### Maari Field Wellhead Platform, Jacket Erection, Malaysia

DLT were sub-contracted to design, supply and operate a skidding and jacking system to incrementally erect a 26m x 22m x 140m high 2800 tonne jacket structure. The sections were lifted using our DL-TS3000 Mk1 jacking tower system, in four tower configuration and using 8 No. DL-C450 climbing jacks. The lifting operations took place in 2007.



### BARD Wind Farm, North Sea, Platform Installation

DLT were responsible for the design, supply and operation of 2 No. 4,704 tonne capacity systems for installation of the transformer platform to the BARD wind farm. The platform is designed to float out and self install. A total of 16 No. DL-S588 strand jacks were supplied, with 8 No. being used for the lowering of the jacket onto the sea bed and 8 No. for lifting the top side up the jacket into final position.

## Reference Projects – Offshore



### Strand jack systems for replacement of thrusters

DLT have supplied and operated many strand jack systems for the installation and replacement of thruster units weighing up to 50 tonnes on drilling ships and floating platforms. Strand jacks provide a compact and cost effective solution for handling heavy thruster units and we have also developed a system of modular power packs and jacks that can be taken through bulkhead doors into the thruster room .



### 14,000 Tonne Topsides Load Out, Malaysia

Working with local partner JWS Engineered Transport Sdn Bhd, DLT were responsible for the supply and operation of a 2,352 tonne capacity strand jack system for load out of the Tallisman Topsides onto the delivery vessel. We used 4 No. DL-S588 strand jacks, powered by 2 No. DL-L120/2/300/D diesel powered hydraulic power packs. JWS have since carried out numerous lifting and skidding operations using DLT strand jacks.



### Sea Drill Pontoon Launch, Singapore

DLT were sub-contracted to side shift and launch 2 No. 3600 tonne pontoon units at the Jurong Shipyard, Singapore, in 2007 for the Sea Drill floating platform No 8. The pontoons were supported on inflated air bags for these operations and moved using 2 No. DL-S185 strand jacks and 2 No. DL-L30F/1/350/120/E power packs for a launching speed of 17m/hour, controlled using the DL-P40 computer control system.



### FPSO Mooring Pendulum Installation, Singapore

DLT were responsible for installation of 2 No. 120 tonne mooring pendulums for SMOE in Singapore, using strand jacks to achieve a positional alignment of +/- 0.2mm for installation of 5 tonne pitch pins.



### Corocoro FSO Mooring Line Tensioning, Venezuela

DLT were sub-contracted to assist in the installation of a FPSO mooring line system 32Km offshore in the Corocoro Oil Field, Venezuela. DLT designed and supplied the strand jack tensioning system to pull pairs of mooring lines toward one another to achieve a 700te bedding tension.



### Strand Jack Systems for Replacement of Thrusters

DLT have supplied and operated many strand jack systems for the replacement of thruster units on floating platforms. Strand jacks provide a compact and cost effective solution for handling heavy thruster units and we have developed a system of modular power packs and jacks that can be taken into confined spaces and through bulkhead doorways.



## Reference Projects – Offshore



### Dismantling of the Brent Spar Oil Storage Platform

DLT were responsible for the design of a 2300 tonne lifting capacity lifting gantry for handling cut sections of the Brent Spar as it was decommissioned in a Norwegian fjord in 1999. The gantry used 4 No. 580 tonne capacity strand jacks for lifting and a gripper jack system for longitudinal movement over the decommissioning barge. The legs and cross beams of the gantry structure were made from a proprietary tower system which were connected and braced using purpose designed steelwork.



### Load out of FPSO Pontoon, Korea

DLT were responsible for the design, supply and operation of a strand jack system to load out a 14,500 tonne FPSO pontoon onto a delivery ship, for main contractor Hyundai. The deck was moved 125m using four 580 tonne capacity strand jacks.



### Recovery of mooring yoke to release FSO from buoy, Mediterranean Sea

DLT were sub-contracted to provide a strand jacking system to raise a mooring yoke to release an FSO vessel from its mooring buoy where it had been located for 20 years. The original 1000te capacity long stroke ram used to install the yoke was unserviceable. DLT engineered a system using 2No DL-S418 strand jacks mounted on a T-frame attached to the FSO using the existing long stroke ram mounting point. The jacks were powered by a DL-L114/4/D diesel engine operated hydraulic power pack.



## Reference Projects - Buildings & Structures



### Calvary Church Convention Centre, Malaysia

DLT were contracted by Victor Buyck (Malaysia) to supply a 4 x DL-S185 strand jack system for erection of 2 No 200 tonne mega trusses, and also for design and supply of a synchronised jacking system to open and close 2 No 270 tonne 'angel' wings located on the roof. The 2 No angel wings are opened to allow fresh air to enter the main hall and also serve as an architectural feature. Each wing is supported by 8 No hydraulic rams with strokes of up to 3.8m and all rams are monitored and controlled centrally using a specially developed control system.



### HAECO Hangar 3A Roof Lift, Hong Kong

DLT were sub-contractors to China State – Leighton JV for the lifting of the 3,520 tonne pre-assembled steel roof. The roof was lifted 30m using 8 No. DL-S418 strand jacks mounted on 4 No. 40m high DL-TS3000 free standing towers and 6 No. DL-S185 strand jacks mounted on the permanent concrete columns.



### Ventian Theatre Roof Erection, Macau

DLT were sub-contractors for the erection of the 940 tonne steel roof structure for the new two thousand seat theatre as part of 'The Venetian' Development in Macau. Our scope included erection engineering, equipment rental and site operation. The roof trusses were assembled on site at ground level and then lifted into position using a climbing jack system. The roof trusses were erected in three separate lifts, each weighing up to 400 tonne.



### Heathrow Airport, New Terminal 5, UK

DLT were responsible for the detailed erection engineering for the 18,500 tonne steel roof structure of the new main core terminal building, and for a 1100 tonne air traffic control tower. Both were fabricated off-site and erected on-site using strand jack lifting systems. The roof box girders, purlins and cladding to the core terminal building roof was erected in 6 No. 2,000 tonne lifts. The control tower was pre-assembled off-site into seven fully complete modules and then assembled on-site using a unique vertical jacking technique.



### New Wembley National Stadium, UK

DLT were responsible for the detailed erection engineering for the 26,000 tonnes of structural steel, including stands, cable suspended roof and main arch structures. The 1,490 tonne main arch was assembled flat and rolled up into position using strand jacks. We were responsible for engineering and supervising this operation.



### Hong Kong Convention & Exhibition Centre.

DLT were responsible for erection engineering, heavy lifting equipment supply and operation for the erection of an 8000 tonne prefabricated roof structure and a 5,500 tonne link bridge. The roof structure was fabricated and assembled in the Philippines into modules weighing up to 460 tonnes each, which were then shipped to the site for lifting and skidding into final position. The link bridge was erected piece small by a stiff leg derrick mounted on a purpose made skid track.



## Reference Projects - Buildings & Structures



### HAECO Hangar 1 Roof Lift, Hong Kong

DLT were responsible for the design, supply and operation of a strand jack lifting system together with associated erection engineering to lift 2 No. pre-assembled roof sections, each weighing over 1000 tonnes. Each section of roof was lifted with 9 No. DL-S185 strand jacks. Temporary works for the lift comprised 3 No. 300 tonne capacity jacking towers, plan bracing to stabilise the roof and a guide track against the concrete core structure.



### HQ1 Building, London

DLT were responsible for detailed connection design and erection engineering of the 6,600 tonnes of steel frame to this sixteen storey office block. This included heavy lifting of a 650 tonne module which was built on a lower floor and then raised 30m to the sixteenth floor. DLT were also responsible for supply and operation of the strand jack system to carry out this lift, using 4 No. DL-S185 strand jacks.



### Virgin Atlantic Airways Hangar Roof Lift, London

DLT were responsible for the detailed erection engineering for the lifting by strand jacks of an 800 tonne roof truss for this aircraft maintenance hangar at Heathrow Airport. The roof structure was assembled at ground level and then lifted using strand jacks mounted on the top of the permanent columns, which were stabilised by rented proprietary towers that were anchored down to the permanent foundations.



### Link Bridges, Hong Kong

DLT were responsible for the design, supply and operation of a strand jack heavy lifting and horizontal skidding system for the erection of two 1100 tonne pre-assembled link bridges in Hong Kong for main contractor, Gammon-Skanska.



### Canary Wharf Tower, London

DLT were responsible for the detailed connection design and erection engineering of the 25,700 tonne steelwork frame for this fifty storey tower block.



### HSBC Bank, London

DLT were responsible for the detailed connection design and erection engineering of the 12,000 tonne steelwork frame for this forty three storey tower block.



### Bank of America Building, London

DLT were responsible for the detailed connection design and erection engineering of the 6,400 tonne steelwork frame for this sixteen storey office block.



### Clifford Chance Building, London

DLT were responsible for the detailed connection design and erection engineering of the 12,300 tonne steelwork frame for this thirty four storey tower block.

### Cairns Convention Centre Phase II, Australia.

The roof to this convention centre is constructed from a complex series of curved 'V' shaped steel trusses that work with a plan tie system in the finished state to provide a rigid and stable structure. To reduce the roof erection cost and programme, the roof was assembled in fully clad panels adjacent to the site and erected onto temporary supports within the building. We were responsible for the detailed erection engineering of the roof, including all temporary supports and stability bracing, which was required to withstand cyclone wind loads at any erection stage.

## Reference Projects - Refinery Construction



### MYQ5000 jacking tower system for refinery construction

In 2014 DLT designed and supplied a 5,000 tonne lifting capacity jacking tower system to China National Petroleum (CNPCC) for use in the erection of heavy petrochemical vessels. The MYQ5000 jacking tower system is able to self-erect and self-dismantle, and is also able to move with the vessel after lifting. The MYQ5000 was successfully function tested to 110% capacity (5,500 tonnes) static load tested to 125% capacity (6,250 tonnes) in December 2014. It features a design to erect 5,000 tonne petrochemical vessels up to 160m high. Vessels can be moved longitudinally, horizontally and can be rotated after lifting. 4 No DL-S1394 strand jacks (1394 tonnes capacity per jack) are used for lifting, 4 No DL-CP400 pinned climbing jacks (400 tonnes capacity per jack) are used for longitudinal and transverse movements. Central monitoring and synchronised control of all jacking systems using a customized and wireless version of our proven DL-P40 computer control system. High accuracy GPS stations located at the top of each tower for monitoring tower verticality. The GPS data is integrated into the DL-P40 computer control system.



### DL-TS3600 jacking tower system for the erection of petrochemical vessels

The DL-TS3600 is a new jacking tower system designed and supplied by Dorman Long Technology to Sinopec Tenth Construction Company in China. The tower system has a gross lifting capacity of 3600 tonnes in two tower configuration and 7200 tonnes in four tower configuration. DL-CP600 pinned climbing jacks (600 tonnes capacity per jack) are used, each tower can be fitted with two or three of these jacks. Vessel can moved longitudinally & transversally and can be rotated 360 degrees with an optional swivel after lifting. Self erection and dismantle option. Uses our proven DL-P40 computer control system.



## Reference Projects - Refinery Construction



### DL-TS3000 Jacking Tower System

The DL-TS3000 jacking tower system can lift vessels up to 3000 tonnes and 150m high. It is able to self-erect and dismantle and with the optional DL-TF1500 is able to operate without a tailing crane. It can operate unguyed up to 70m high in storm winds of up to 40 m/sec. All components are transported in standard shipping containers for economic relocation between sites. The DL-TS3000 jacking tower system is currently operated by Sarens



### Formosa Plastics Plant, Taiwan

DLT were responsible for the design, supply and operation of a 100m high modular jacking tower system for the erection of thirty six petrochemical vessels ranging from 1120 tonne at 30m high through to 1450 tonne at 115m high.

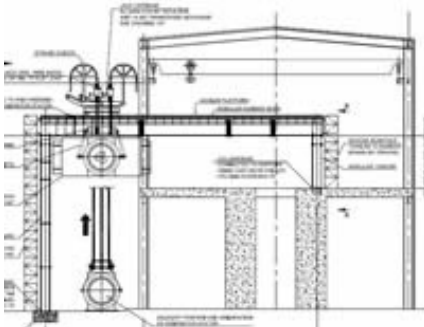


### 2500 Tonne Strand Jack Tower System, China

DLT were responsible for the conceptual and detailed design of this 2500 tonne lifting capacity modular strand jack tower system, specifically designed for the Chinese refinery construction market. The tower system is owned and operated by the No. 4 Construction Company of SINOPEC and has many new features including self-erection and luffing under full load.

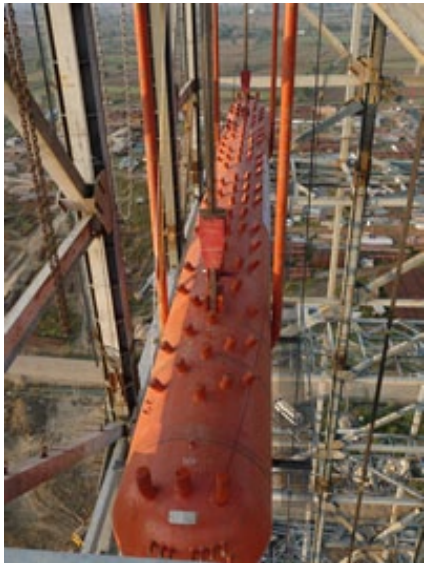


## Reference Projects – Power and Industrial



### DL-GA540 Generator installation gantry, India

DLT supplied a 540 tonne capacity modular gantry for installation of generators to Lift and Shift India. The gantry is modular to accommodate the geometry of each site and incorporates folding strand jacks to allow the generator and strand jack carriage to move together into the turbine hall without the need to remove a section of the overhead crane rail to provide extra headroom. The gantry is able to lift, rotate and move the generator into final position and incorporates both transverse and longitudinal movement systems to allow the generator to be set accurately onto its foundations.



### BHEL 370 tonne capacity strand jack system, India

DLT supplied a 370 tonne capacity strand jack lifting system to BHEL Western Division and Northern divisions in India for use in the construction of power stations. The system comprises 2 No DL-S185 strand jacks powered by 2 No electrically powered hydraulic power packs for a lifting speed of 20 m/hr and controlled using our DL-M2 pendant control system. The steam drum is delivered and positioned at ground level directly under final position and then lifted vertically to final height and then transferred from the strand jacks to permanent hangers. BHEL Western division has erected around 10 steam drums using this equipment.



### 3 No 324 tonnes Chimney flue cane lifting systems to Gammon India

DLT supplied 3 No 3 x 108 tonne capacity strand jack lifting systems to Gammon India Limited. Gammon has used these systems throughout India for the erection of flue cane segments in RCC Chimney. The system of 3 No DL-S108 strand jacks is powered by 1 No DL-L15/4/300/E electrically powered hydraulic power pack and uses DL-P40 computer control system for monitoring, accurate synchronisation and control. The flue cane segments are erected in parts weighing up to 300 tonnes. The segment is delivered and positioned directly under final position at ground level through a wheeled trolley over rails, then lifted vertically with strand jacks and then transferred from the strand jacks to the permanent beams. The strand jacks are then lowered to lift another segment till the complete erection of the flue cane segments is completed up to a height of around 275m.



### Steam Drum & generator Installations, USA & India

DLT have provided engineering, strand jack systems and site supervision to clients in India and the USA for lifting and installation of a number of steam drums and generators weighing up to 380 te and lifted up to 70m..



## Reference Projects – Power and Industrial



### Blast Furnace Re-Lining, Taiwan

DLT were sub-contractors for installation of a new 40.75m high 3115 tonne furnace line in Taiwan. Our scope included full engineering of all temporary works required together with supply of jacking equipment and site labour to carry out the work. The blast furnace was delivered to the site in eight segments, weighing up to 477 tonnes each, which were lifted and skidded into the furnace house before being jacked vertically and aligned for welding. These operations were carried out using a mix of strand jacks and climbing jacks.



### Steam generator replacement, USA

In November 2010 Rigging International used 2 No DL-S418 strand jacks to replace a steam generator in the SONGS nuclear power plant in California. The lifting system comprised 2 No DL-S418 strand jacks powered by 1 No DL-L60/4/300/D diesel powered hydraulic power pack for a lifting speed of 14 m/hr and controlled using our DL-P40 computer control system. The operation took place adjacent to a live nuclear reactor in an environment with very high electrical magnetic interference. Our DL-P40 computer control system was approved for use in this environment following a successful 24 hour continuous running test on the site..



### Pinalito Hydroelectric Plant, Dominican Republic

DLT were employed by Odebrecht to supply equipment and site supervision to install a water distribution pipe which was required to pass over one of Dominican's many mountains. DLT's equipment and supervisors assisted in the installation of the pipe, pulling a total of seventy eight sections, from ten different locations using DLT strand jacks. The maximum pull was 132 tonnes, and the longest pull 157m.



### Lal-Pir Power Station, Pakistan

DLT were responsible for the design, supply and operation of a system to lift, skid, rotate and lower into final position of a 350 tonne generator. The generator was delivered outside the building and was lifted off the transporter using 4 No. DL-S105 strand jacks mounted on a purpose made transportation frame, which sat on a skid track running into the building. Once in the building the generator was rotated 90 degrees on a purpose made turntable and skidded a further 10m before being lowered into final position.



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