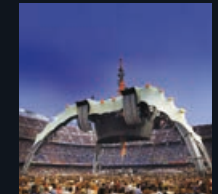


# Integrated Solutions



# Enerpac Integrated Solutions

With more than 50 years of experience, Enerpac has gained unique expertise in delivering hydraulic solutions for the controlled movement and positioning of heavy loads.

This expertise has been acknowledged by the world's leading industrial professionals and has contributed to the successful movement of a number of the most recognizable structures on earth.

In addition to providing the most comprehensive line of globally-supplied, locally supported products, Enerpac combines hydraulics, steel fabrication and electronic control with engineering and application knowledge, to design and manufacture solutions that ensure your projects are completed safely and efficiently.

- **HYDRAULIC GANTRIES** *page 4*
- **STRAND JACKS** *page 5*
- **SKIDDING SYSTEMS** *page 6*
- **SELF-PROPELLED MODULAR TRAILER** *page 7*
- **SYNCHRONOUS LIFTING SYSTEMS** *page 8*
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- **PROJECT GALLERY** *pages 10-27*



# EXPERIENCE and EXPERTISE



## HYDRAULIC POWER UNITS

Enerpac designs, assembles and tests small to large hydraulic power units in-house. Power units range from 0,5 to 240 kW and are tested with the system they are intended to operate.



## STEEL FABRICATION

Enerpac has a dedicated facility for steel fabrication and welding. We design and manufacture custom structures used in demanding heavy-lifting applications.



## ELECTRONICS

Enerpac designs all control systems in-house. This capability keeps control technology close to the design engineers who are developing the rest of the system. In doing so, we can tailor the control system to match unique project requirements.



## ENGINEERING

Enerpac has a multi-disciplined engineering team capable of design and development of all aspects of an Integrated Solutions system. Leveraging design and application experience with the latest in computer software, rapid prototyping and analysis methods ensures delivery of the highest quality systems.



## MACHINING

Enerpac utilizes the latest in CNC machining technologies and manufactures all large and special hydraulic cylinders in-house. We can machine diameters up to 1000 mm with lengths to 6000 mm.



## FIELD SUPPORT

Enerpac Integrated Solutions is available to provide on-site support including training and troubleshooting of systems. We also stock repair parts and consumable items at several locations to ensure fast delivery and minimal downtime.



## MAINTENANCE and REPAIR

Due to the unique nature of Enerpac's Integrated Solutions systems, we offer complete maintenance and repair services. Our M&R group is available to assist customers who do not have access to local service facilities qualified to work on these systems.

# HYDRAULIC GANTRIES

## The complete range of hydraulic gantries for your most demanding lifting and rigging operations

Hydraulic Gantries are a safe, efficient way to lift and position heavy loads in applications where traditional cranes will not fit and permanent overhead structures for job cranes are not an option.

Hydraulic Gantries are placed on skid tracks to provide a means for moving and placing heavy loads, many times with only one pick.

Enerpac offers three series of Hydraulic Gantry systems:

- the cost effective SL-Series offers entry level control and capacity
- the heavy duty SBL-Series offers capacities up to 1100 ton and 3-stage lifting capability through the boom structure
- the MBL-Series incorporates all features of the SBL-Series and offers full lifting capacity over the full stroke. The MBL Gantries have been designed with increased footprint stability and can therefore lift using 2 legs as well as 4.

All Enerpac gantries are delivered with specific properties and control systems to ensure optimum stability and safety.

Hydraulic Gantries							
Capacity (with 4 towers) (ton)			Model Number	Lift Height (mm)			Weight (per tower) (kg)
1st stage	2nd stage	3rd stage		1st stage	2nd stage	3rd stage	
60	60	n/a	<b>SL60</b>	3397	4956	n/a	1050
125	125	n/a	<b>SL125</b>	4635	6700	n/a	2130
400	400	195	<b>SL400</b>	5228	7236	9144	4600
500	500	300	<b>SBL500</b>	4988	6898	8608	6300
900	600	n/a	<b>SBL900</b>	8300	11.300	n/a	13.350
1100*	688	383	<b>SBL1100</b>	7004	9688	12002	11.950
500	500	n/a	<b>MBL500</b>	N/A	12.867	n/a	19.750
600	600	n/a	<b>MBL600</b>	N/A	14.522	n/a	20.950

\* Extends simultaneously through all stages with constant lifting capacity



## OVERVIEW



### KEY FEATURES:

- Self-contained hydraulics and electrics
- Intelli-Lift wireless control system
- Self-propelled wheels or tank rollers
- Foldable boom on **SBL1100**, **MBL500** and **MBL600**
- Full range of supplementary equipment: header beams, lifting lugs, side shift, skid tracks
- All gantries are ASME B30.1 compliant.

# STRAND JACKS

## Compact high-capacity system for controlled lifting and lowering

A strand jack can be considered a linear winch.

In a strand jack, a bundle of steel cables or strands are guided through a hydraulic cylinder. Above and below the cylinder are anchor systems with wedges that grip the strand bundle simultaneously, this is how the strand jack is able to carry a load. Lifting and lowering a load is achieved by hydraulically controlling the main jack and both mini jacks alternately.

Enerpac utilizes Smart Cylinder Control (SCC), ensuring full control of the lifting and lowering operation.

Today strand jacks are widely recognized as the most sophisticated heavy lifting solution. Strand jacks are used all over the world to erect bridges, load out offshore structures, and lift/lower heavy loads where the use of conventional cranes is neither economical nor practical.

Strand Jack				
Capacity	Strand Diameter	Model Number	Number of Strands	Weight
(ton)	(mm)			(kg)
15	18	<b>HSL1507</b>	1	100
30	15,7	<b>HSL3006</b>	3	500
45	18	<b>HSL4507</b>	3	500
60	18	<b>HSL6007</b>	4	650
70	15,7	<b>HSL7006</b>	7	640
100	18	<b>HSL10007</b>	7	850
200	15,7	<b>HSL20006</b>	19	1300
200	18	<b>HSL20007</b>	12	1400
300	18	<b>HSL30006</b>	31	2180
300	15,7	<b>HSL30007</b>	19	2180
450	18	<b>HSL45007</b>	31	3050
500	15,7	<b>HSL50006</b>	48	3150
650	18	<b>HSL65007</b>	43	3950
850	18	<b>HSL85007</b>	55	5000
1000	18	<b>HSL100007</b>	66	7650
1250	18	<b>HSL125007</b>	84	8300



## OVERVIEW



### KEY FEATURES:

- Full control of lifting and lowering through SCC control
- Two sizes strand diameter: 15,7 and 18 mm
- Complete line of electric and diesel power packs
- Nickel plated telescopic pipes preventing bird caging
- Standard supplied with lifting anchor
- Automated locking – unlocking operation
- Special corrosion treated high endurance multi-use wedges
- Full range of accessories: strand dispenser, strand guide, re-coiler, strand tensioner.

# SKIDDING SYSTEMS

## An ancient technology meets the 21st century

The HSK skidding system is comprised of a series of skid-shoes powered by hydraulic push-pull cylinders, travelling over a pre-constructed track.

A series of special PTFE coated blocks are placed on the skid-tracks. The PTFE surface is matched with a sliding plate under the Enerpac skid shoes, designed to achieve minimum friction coefficients. The skid shoes are connected by hoses to a hydraulic electric or diesel driven power pack.

In addition to our standard skidding systems we have the capabilities to create customized skidding systems to meet your specific requirements.

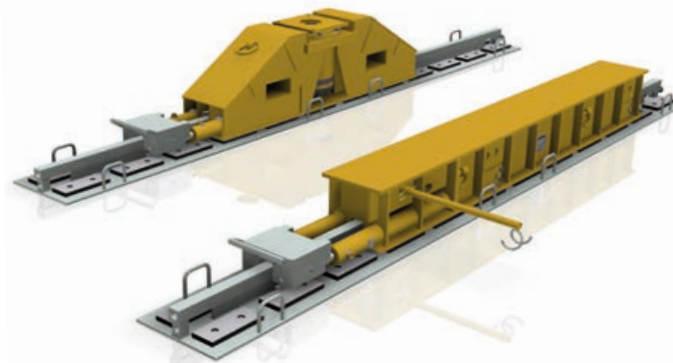
Enerpac Skidding Systems are available in three versions:

- **HSK1250** with a capacity of 125 ton per skid unit
- **HSK2500** with a capacity of 250 ton per skid unit
- **HSK1H2500** with a capacity of 250 ton per skid unit and a lower collapsed height

The HSK1250 and HSK2500 skidding systems are available in 2 varieties: using a “skid shoe jack” or a “skid shoe beam”. The skid shoe jack includes an integrated lifting cylinder. A skid shoe beam is designed for skidding purposes only.

To calculate the minimum required capacity per shoe, the entire load has to be able to rest safely on 2 of the 4 shoes. To skid a load of 500 ton, the required skidding system is **HSK2500**.

Skidding Systems					
Capacity (per shoe)	Model Number	Skid Shoe	Stroke Push/Pull Cylinders	Stroke Lifting Cylinder	Weight (per shoe)
(ton)			(mm)	(mm)	(kg)
125	<b>HSK1250</b>	beam	600	n/a	740
		jack	600	175	790
250	<b>HSK2500</b>	beam	600	n/a	1020
		jack	600	175	1450
250	<b>HSK1H2500</b>	beam	600	n/a	340



## OVERVIEW



### KEY FEATURES:

- PTFE skid pads with dimpled surface for low friction and long lifetime
- Easy to replace skid pads, no tools necessary
- Unique gripper anchor system complete with lever for easy selection of skidding direction
- Double acting hydraulic cylinders with sufficient capacity in both push and pull direction. No need to turn the skid shoe for reverse skidding direction
- Large load support surface on the skid beam
- Bottom of skid shoes equipped with stainless steel sliding plates.

# SELF-PROPELLED MODULAR TRAILER

## Hydraulic strength in a linear drive transport system

The Enerpac Self Propelled Modular Trailer features a minimized height and slim design, which make it very easy to operate in confined spaces. Each unit has 3 axles. Each wheel unit has a steering as well as a lifting cylinder at its disposal. Wheel propulsion is accomplished by hydraulic propulsion. The power pack has a 54 kW tier 4 driven engine.

The SPMT is controlled by Intelli-drive, a wireless control system that allows the entire system to be operated by one person.

One of the unique features of the system is that it is able to be containerized. Two units and a power pack can be shipped inside a 20 ft. container.



Self-Propelled Modular Trailer

Capacity (per trailer)  (kN)	Model Number	Transport Speed (1 trailer)		Steering Range	Lifting Range  (mm)	Collapsed Height  (mm)	Length (1 trailer)  (mm)	Width (1 trailer)  (mm)	Weight (per trailer)  (kg)
		unloaded (km/h)	loaded (km/h)						
600	<b>SPMT600</b>	3	0,8	+175° to -175°	384	764	3075	2300	8500

## OVERVIEW



### KEY FEATURES:

- Multiple configurations possible
- Reduced height and slim design
- Intellidrive wireless control system
- Up to 3 units per power pack.

# SYNCHRONOUS LIFTING SYSTEMS

## The combined strength of hydraulics and digital control

To achieve high-precision movement of heavy objects it is necessary to control and synchronize the movements of multiple lifting points. The PLC-control uses feedback from multiple sensors to control the lifting, lowering and positioning of any large, heavy or complex load, regardless of weight distribution.

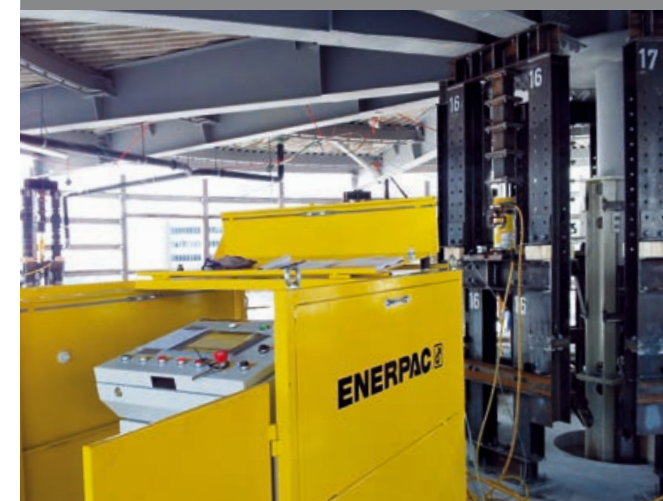
The Enerpac EVO-Series provide the required level of force and control for most applications. We can also provide custom systems tailored to unique project requirements.

The EVO system offers additional features including a greater number of lift points, center of gravity, and tilting/weighing capabilities.



Synchronous Lifting Systems								
Lift Points	Model Number	Integrated Pump	Accuracy (mm)	Touch Screen Control	Options			
					Levelling	Weighing	CoG	Expandable
4, 8, 12	<b>EVO</b>	yes	1	yes	yes	yes	yes	yes

## OVERVIEW



### KEY FEATURES:

- Single operator controls all movements from a central position
- Modular lifting system to control 4, 8 or 12 lifting points
- Single or double-acting cylinders with the same or different lifting capacities
- Accuracy of 1 mm between leading and lagging cylinders
- Intuitive user interface provides easy set-up and control with multiple lifting points
- Network capability to link up to 4 HPU's to a separate master control box via wireless control.



# CUSTOM SOLUTIONS

## SYNCHRONOUS HOISTING



A unique crane product for below-the-hook positioning of heavy loads that require precision placement. May reduce the number of cranes needed and reduce the costs for multiple picks.

## BRIDGE LAUNCHING



Providing a solution for the most complex and demanding bridge construction applications, Enerpac has over 20 years experience providing unique customer bridge launching systems.

## STRAND JACK GANTRY



The strand jack gantry is a steel structure to facilitate lifting and skidding back, forth and sideways of heavy loads. The Enerpac strand jack gantry allows you to operate in confined spaces.

The system consists of 3 major components:

- Steel Construction
- Strand Jacks for Vertical Lifting (HSL-Series)
- Skidding System for horizontal skidding (HSK1250)

This is powered by a hydraulic power unit that is situated on ground level. The capacity, height and width of the construction can be modified in cooperation with our engineering team.

## SELF-ERECTING TOWER



The Enerpac Self-Erecting Tower is a self-erecting-tower-lift system that enables you to build a free standing gantry from ground level. The Self-Erecting Tower can be supplied in various capacities and heights and is built with standard modular components, enabling a flexible solution to future project demands.

The Self-Erecting Tower enables moving the load in all directions: lifting, lowering, skidding back and forth, and side shift capabilities. Lifting and skidding are achieved using standard Enerpac strand jacks that can also be used for other applications.

The Self-Erecting Tower is a versatile lift-system that can be used in a wide variety of operations, for example the installation of reactor vessels in a petrochemical plant or erecting a shipyard crane. When compared with large capacity cranes, the Self-Erecting Tower significantly reduces transportation and set up costs.

# PROJECT GALLERY

**INFRASTRUCTURE** *pages 11-13*

**POWER GENERATION** *pages 14-15*

**OFFSHORE** *pages 16-17*

**MINING** *pages 18-20*

**SHIPBUILDING** *page 21*

**ENTERTAINMENT** *pages 22-23*

**PETROCHEMICAL** *pages 24*

**OIL AND GAS** *pages 25-27*



- PROJECT
- LOCATION
- YEAR
- EQUIPMENT

City Bridge Nijmegen  
Nijmegen, The Netherlands

2012-2013

HSL-SERIES HEAVY LIFTING STRAND JACKS  
RR-SERIES HYDRAULIC CYLINDERS AND SPECIAL PUMPS

# INFRASTRUCTURE



The Nijmegen City bridge, which will be known as “De Oversteek” (The Crossing), has a main span of 285 meters and a height of 60 meters. Construction requires lifting and precisely positioning of concrete and steel assemblies. With a wide range of high pressure tools and sophisticated hydraulic equipment, Enerpac is able to provide the needed combination of heft and precision.

- PROJECT
- LOCATION
- YEAR
- EQUIPMENT

San Francisco-Oakland Bay Bridge

San Francisco, California, USA

2005-2013

HSL-SERIES HEAVY LIFTING STRAND JACKS

# INFRASTRUCTURE



State-of-the-art hydraulics are facilitating the construction of the new San Francisco – Oakland Bay Bridge. Enerpac Strand Jacks and Synchronous Lift Systems were used to erect key components of the bridge. The 1800 ton transition spans were lifted from a barge and raised to deck level using several 300 ton strand jacks. These spans link the east skyway to the self-anchored suspension (SAS) span. For the SAS tower, sections were raised into position using 650 ton strand jacks and then levelled using a 4 point synchronous lift system.

- PROJECT
- LOCATION
- YEAR
- EQUIPMENT

Millau Viaduct

France

2001-2005

INCREMENTAL LAUNCHING EQUIPMENT  
SYNCHRONOUS LIFTING EQUIPMENT

# INFRASTRUCTURE



To create the world's tallest bridge, the construction partnership of Eiffage and Enerpac developed hydraulic construction and control solutions for incremental deck launching, deck nose recovery, and temporary pier erection. Enerpac supplied the equipment that was necessary to safely manage the 35.000 ton, 2460 meter long steel deck, situated 270 meter in the air. It was launched around a 20 km radius and positioned with millimeter precision.

- PROJECT
- LOCATION
- YEAR
- EQUIPMENT

Positioning Equipment Owen Springs Power Station  
Alice Springs, Australia  
2012  
SBL-SERIES HYDRAULIC GANTRY

# POWER GENERATION



An SBL1100 hydraulic gantry was used to install diesel/gas generators and alternator sets each weighing hundreds of tons at the new Owen Springs Power Station near Alice Springs in the desert heart of Australia. All three 10,9 MW diesel gas generators were unloaded onto their respective foundations in a single operation. The gantry's lifting height and side shift capability enabled the equipment to be maneuvered into their bays sideways.



- PROJECT
- LOCATION
- YEAR
- EQUIPMENT

Steam Generator and Reactor Head Replacement  
 New Orleans, Louisiana, USA  
 2012  
 SELF-PROPELLED MODULAR TRAILER SPMT600

# POWER GENERATION



To provide radiation shielding on the bottom of a Reactor Vessel Head Assembly, a 4,2 m diameter, 0,9 m thick steel plate needed to be transported through a narrow passage way of the reactor building equipment hatch. In order to avoid having to wait for a larger opening to become available, the SPMT600's size and load carrying capacity allowed for transporting the plate through the existing hatch, thus saving critical time on the project.



- PROJECT
- LOCATION
- YEAR
- EQUIPMENT

Napoli Vessel Salvage  
English Channel, United Kingdom  
2009  
CHAIN PULLERS

# OFFSHORE



The MCS Napoli was caught in a storm and was beached in Lyme Bay in 2007. The ship cracked and was broken up into sections. The 3450 ton back of the ship, measuring 65 m by 36 m, was hoisted onto two pontoons using 24 hydraulically operated chain pullers, each with a lifting capacity of 227 ton. Once on the pontoon, the wreck was sawn into pieces before being transported to land.



- PROJECT
- LOCATION
- YEAR
- EQUIPMENT

Platform Recovery

Germany

2010

HSL-SERIES HEAVY LIFTING STRAND JACKS

# OFFSHORE



A salvage contractor's offshore platform installation was unstable and at risk. Enerpac presented the contractor with a fully engineered recovery solution to lift the platform to safety. Enerpac later supplied them with 16 strand jacks and 120 ton of fabricated structures, and soon the platform was lifted to its required elevation and secured.

- PROJECT
- LOCATION
- YEAR
- EQUIPMENT

Sino Iron Ore  
Cape Preston, Australia  
2009  
HSL-SERIES HEAVY LIFTING STRAND JACKS

# MINING



An Enerpac Strand Jack Lifting system was employed to construct Australia's largest ever magnetite mining and processing operation. With the HSL-series strand jack system, pairs of 800 ton iron ore mills and 1400 ton autogenous mills were lifted and then lowered onto their bearings 21 meters above the ground.

- PROJECT
- LOCATION
- YEAR
- EQUIPMENT

Dozer Track Maintenance  
Alberta, Canada  
2012  
DLS-Series, Dozer Lift System

# MINING



Enerpac's Dozer Lift System provides a safe, efficient, and flexible solution for conducting maintenance on dozers. It enables users to raise and lower the dozer from a safe distance while having the ability to stop in any position with the load mechanically locked in place. The lifting cylinders have the capability to remain under the dozer as jack stands while the control unit is disconnected and used for a second set of stands. The system has a customizable design which ensures proper fit and jacking heights.



- PROJECT
- LOCATION
- YEAR
- EQUIPMENT

Dragline Mining Shovel Maintenance  
Calama, Chile  
2009  
SYNCHRONOUS LIFTING SYSTEM

# MINING



Minimizing equipment downtime is critical to mining operations. Enerpac provided a solution for high capacity, safe, and efficient shovel maintenance lifting. The Enerpac Synchronous Lifting System automatically lifts and lowers cylinders in unison negating the need for multiple jack operators. Synchronized lifting has increased safety and productivity.

- PROJECT
- LOCATION
- YEAR
- EQUIPMENT

Hoisting Ship Sections  
Williamstown, Australia  
2012  
SHS-SERIES SYNCHRONOUS HOISTING SYSTEM

# SHIPBUILDING



The Enerpac SyncHoist system enhances crane performance and safety, offering horizontal and vertical load maneuvering. A system of 4 x 110 metric ton cylinders with 1500 mm stroke lengths was used with one crane to align the steel blocks of the ship's control tower sections. The SyncHoist system allowed a gradual lift of the load and dynamic adjustment in relation to the center of gravity during the lift.

■ PROJECT	Vegas High Roller Observation Wheel
■ LOCATION	Las Vegas, Nevada, USA
■ YEAR	2014
■ EQUIPMENT	MECHANIZATION SYSTEM & HYDRAULIC ROTATING MECHANISM

# ENTERTAINMENT



The skyline in Las Vegas has changed thanks to the construction of the 168 m High Roller Observation Wheel. Enerpac supplied two major components for the wheel. The first and major component was the Mechanization System which is the primary system used to drive the wheel every day for the expected 50 year life span. The second component was the HRM (Hydraulic Rotating Mechanism) which was used to erect the rim of the wheel.



- PROJECT
- LOCATION
- YEAR
- EQUIPMENT

U2 360° Tour Stage

Global

2009

SYNCHRONOUS LIFTING SYSTEM

# ENTERTAINMENT



A Synchronous Lifting and Climbing System was used to assemble and dismantle the 230 ton stage construction for U2's 360° Tour. The steel construction consisted of a central block that rests upon four legs, each made up of six sections. The central block was gradually lifted off the ground in 38 steps and a section was added to each of the four legs after every 6 steps. The complete climbing system for each stage consisted of 16 lifting cylinders, 16 locking cylinders and 4 hydraulic power units. Enerpac's Synchronous Lifting System raised the modular stage construction to a height of 30 m quickly and safely.

- PROJECT
- LOCATION
- YEAR
- EQUIPMENT

Hydro-Cracker Installation

Russia

2014

ENERPAC SELF-ERECTING TOWER (ESET)

PETROCHEMICAL



Customer turned to Enerpac to discuss an alternative solution compared to cranes. Enerpac supplied its Enerpac Self-Erecting Tower (ESET) to lift and position the hydrocracker vessels. Providing a complete heavy lifting solution, the ESET combines Enerpac's heavy lifting strand jacks with gantry and skidding technologies—lifting up to 1450 ton loads to a height up to 76 m.



- PROJECT
- LOCATION
- YEAR
- EQUIPMENT

Offshore Production Facility

Gulf of Mexico

2013

4 x HSL6500 with 65kW HPU's and controls

# OIL and GAS



During construction of a Tension Leg Platform, which will serve as an offshore production facility in the Gulf of Mexico and is projected to be located in water depths of in excess of 1525 m, Enerpac strand jacks were utilized for loading out the utility, drilling, and process modules. Each of these modules weighed approximately 6350 ton and required 1360 ton of pulling force during the load-out procedure.

- PROJECT
- LOCATION
- YEAR
- EQUIPMENT

Adriatic LNG  
Porto Levante, Italy  
2007

HSK-SERIES SKIDDING SYSTEM  
HSL-SERIES HEAVY LIFTING STRAND JACKS

# OIL and GAS



Construction of the world's first LGN regasifier, built with 90.000 m<sup>3</sup> of cement and 30.00 ton of steel, required lifting and skidding solutions that could stand up to these extreme conditions. Enerpac HSK-Series skidding systems, in conjunction with HSL-Series heavy lifting strand jacks, provided the solution, which compensated for skidding on uneven ground, and lifting deck modules and equipment of up to 3000 ton.

- PROJECT Malaysia Marine and Heavy Engineering (MMHE)
- LOCATION Johor Bahru, Malaysia
- YEAR 2013
- EQUIPMENT PLC-CONTROLLED SYNCHRONOUS LIFTING TECHNOLOGY  
352 HIGH-PRESSURE 300-TON HYDRAULIC CYLINDERS

# OIL and GAS



The superlifting and launch of a 43.000-ton floating oil production system in Malaysia for the Gumusut-Kakap offshore field has set high benchmarks for safety through its use of sophisticated synchronous hydraulics to lift, balance, weigh and smoothly launch massive resources structures. The active skids, mounted on guidance tracks, were used for weighing and establishing structures' centre of gravity to ensure safety and structural integrity.



● **INTEGRATED SOLUTIONS** Locations

● **ENERPAC** Locations

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