

Jack-Ups

Our Activities

Technology
Creating
Value



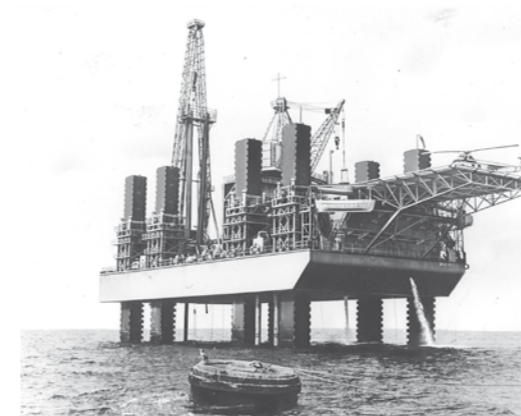
SBM
OFFSHORE

The horizon is just the beginning. Our challenge is to see beyond it.

Applications for offshore energy



Jack-ups



Seashell

GustoMSC has been active in Jack-Up Technology since late 1950s. The first offshore drilling jack-up delivered by the Gusto Shipyard in 1960 was the SEASHELL.

Since those early days GustoMSC, a member of the SBM Offshore Group, has continued with the design, engineering and delivery of jack-up platforms for a variety of applications. Many platforms have been designed and delivered to the oil and gas industry and civil construction companies. The current market focus is on jack-up technology for the wind farm industry and the oil and gas industry. GustoMSC provides proprietary jack-up designs and associated equipment for exploration, construction and production.

Exploration



Maersk Innovator (CJ70)

Exploration

CJ series of jack-ups



COSL 936 (CJ46)



Maersk Inspirer (CJ70)

Since the late 1950s, GustoMSC has been involved in the design, engineering and construction of different type of jack-up drilling units. In the early 1980s GustoMSC introduced the successful CJ series of jack-up drilling units.

The units built in the 1980s and 1990s were provided with a classic cantilever for drilling over a platform. In the late 1990s GustoMSC introduced the patented X-Y cantilever concept, which has been provided on the units since. The X-Y cantilever enhances drilling efficiency and reduces the weight of the cantilever, thus increasing the unit's capacity. With the X-Y system the load charts of the cantilever allow for maximum hook loads over the full envelop, improving development drilling over fixed platforms.

The modern Variable Speed Drive jacking systems and the reliable fixation systems, developed in-house, with a sturdy leg design enables a safe operation of the unit for its intended environment. The combination of the large net deck area, the X-Y cantilever system and the 'wrap around the leg' deck-house creates an efficient drilling machine for deep, complicated high-pressure high-temperature wells. The CJ series of drilling jack-ups meet industry requirements for operations in shallow water and in benign deepwater environments and, with the CJ62 and CJ70, for operations in harsh environments in 150 m North Sea conditions.

The CJ series of drilling jack-ups ranges from 250 ft to 450 ft water depth, as shown in the overview below.

Class	CJ36	CJ46	CJ50	CJ62	CJ70
Number built or under construction	-	10	6	2	3
Water depth	250 ft	350 ft	400 ft	400 ft	450 ft
Area	Moderate environment	Moderate environment	Moderate environment	Harsh environment	Harsh environment
Variable load	8,000 kips	9,000 kips	9,000 kips	10,500 kips	17,500 kips



Jacking system



X-Y cantilever



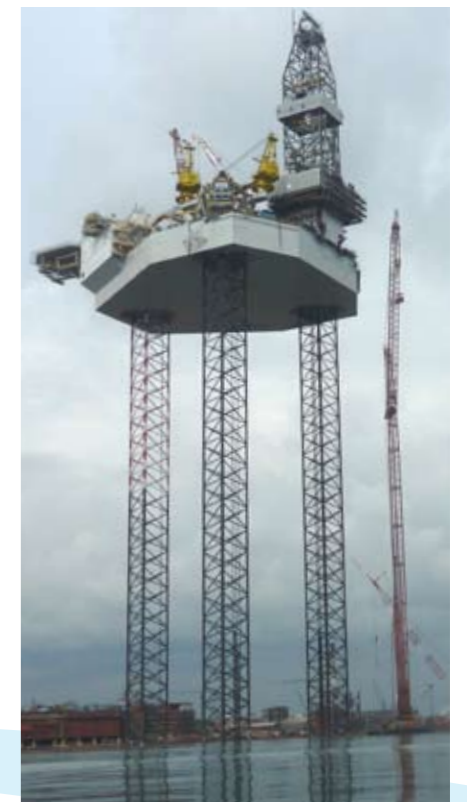
Fixation system



West Epsilon (CJ62)



Maersk Resilient (CJ50)



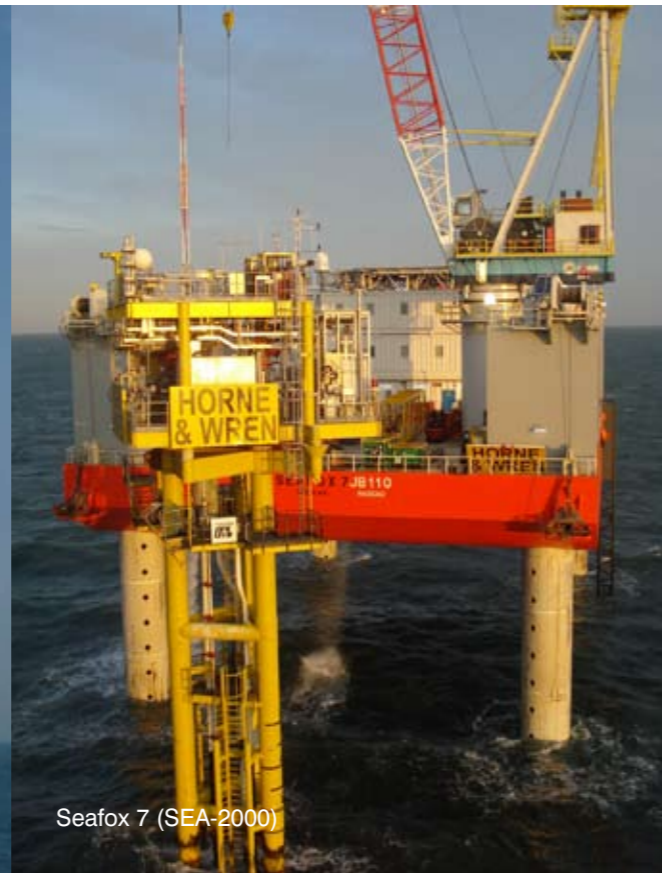
Naga 2 (CJ46)

Construction

SEA series of construction jack-ups



Buzzard (SEA-1250) and Vagant (SEA-800)



Seafox 7 (SEA-2000)

GustoMSC is one of the market leaders in jack-up units for the construction market. Over 50 units have been designed and delivered since the early 1960s. These types of units are used for civil construction activities near shore or in estuary, for offshore accommodation and installation support activities and for the emerging offshore wind farm industry.

Typically for the civil construction activities, these self-elevating platforms are four-legged units without any propulsion and limited accommodation. The versatility of this SEA series can be

Class	SEA-800	SEA-900	SEA-2000	SEA-3250
Number built or under construction	1	1	5	1
Hull	43.5 x 22.5 m	48 x 23.5 m	55.5 x 32.2 m	75.9 x 40 m
Leg length	57.5 m	60 m	73.2 m	90 m
Water depth	30 m	30 m	40 m	45 m
Variable load	1,000 t	1,100 t	1,250 t	3,800 t

seen in the wide range of applications and ease of conversions. They can operate in accommodation mode with modular accommodation units, as support units for offshore oil & gas production platforms or used for pile driving at jetties or, equipped with a heavy and high lift crane, for the installation of wind turbines.



Sea Worker (SEA-2000)

Construction

NG series



Seajacks Leviathan (NG-2500X)

For the offshore construction, maintenance well servicing and installation markets, GustoMSC has developed the proprietary NG class of units. The NG class has been introduced for situations where mobility, self-powered propulsion and positioning at the jack-up location are the leading prerequisites for efficient use. The streamlined barge shape allows a sailing speed of up to 10 knots at full draft. The thruster system (which can be

an all azimuthing system or a combined system of azimuthing thrusters and bow thrusters) enables controlled positioning with often a DP2 class notation. As it has its own propulsion, the unit is independent of the availability of tugs and its operational envelop is enhanced with more workable days.

Class	NG-600	NG-1650	NG-2500X
Number built or under construction	1	1	5
Hull	55 x 18 m	50 x 30.5 m	61.2 x 36 m
Leg length	45 m	78 m	85 m
Water depth	25 m	48 m	40 m
Variable load	550 t	650 t	1,300 t



Wind (NG-600)



Bima (NG-1650)



Seajacks Kraken (NG-2500X)

Construction

Wind Turbine Installation Vessels



In the field of renewable energy, a new and challenging market is the development of offshore wind farms. In the years ahead, quite a number of these projects will be realised. The installation of these numerous wind turbines will require specialised equipment.

GustoMSC has been addressing this market as designers of installation units and turnkey suppliers of special equipment ranging from the main crane to efficient handling

tools for monopiles or rotor upending. The installation contractors will require units best suited for their intended operations. GustoMSC has developed a range of suitable solutions. These units feature a four-legged configuration (ease of preload), a continuous hydraulic jacking system or a rack and pinion system, self-propelled and DP2 class positioning. Combined with a large variable load and a huge deck area, these units can serve as efficient installation units.

Class	NG-5500C	NG-7500C	NG-9000C	NG-10000X4
Number built or under construction	-	-	3	-
Hull	81 x 41 m	101 x 40 m	129 x 39 m	115 x 50 m
Leg length	85 m	81.5 m	81 m	115 m
Water depth	45 m	45 m	45 m	65 m
Variable load	3,000 t	5,000 t	6,000 t	6,500 t
Main crane	800 t	800 t	800 t	1,200 t



Wind Lift I



NG-10000X4

Production

MOPU, MOPUstor, MOPUdrillstor



Especially in recent years with higher oil prices, self-installing production jack-ups have proven to be flexible and cost-effective solutions for the development/redevelopment of oil and gas fields. GustoMSC, with its vast experience in the design and construction of floating process modules, was able to combine this with the jack-up technology and introduced the MOPUstor concept.

To date several solutions have been proposed and accepted by the industry. The MOPUs range from the MOPU (without storage), MOPUstor (with subsea storage tank) to the MOPUdrillstor (also supports a drilling package). An additional major advantage of this design concept is the self-installation capability. No expensive hook-up or offshore commissioning is required as all systems can be tested and commissioned at quay side.

Unit	MOPU + FSO Saparmyrat Turkmenbashi	MOPUstor Yme Talisman SIRI	MOPU Deep Panuke Encana	MOPUdrillstor
Number built or under construction	1	2	1	-
Hull	100 x 60 m	57 x 54 m	52 x 62 m	85 x 60 m
Leg length	80 m	100 m	89 m	105 m
Water depth	54 m	93 m / 65 m	45 m	120 m
Storage tank	n.a.	350,000 bbls	n.a.	350,000 bbls

The MOPUstor concept combines two aspects in the subsea tank: the base for the jack-up and a storage facility for the produced oil. The jack-up unit is based on proven technologies with a tubular leg design and a hydraulic pin-in-the-hole jacking system. At the required elevation, the hydraulic cylinders can be locked to ensure safety.

To date GustoMSC has been involved in the design and engineering. Some of them are SBM Offshore turnkey deliveries or lease and operate.



MOPUdrillstor

Associated Equipment

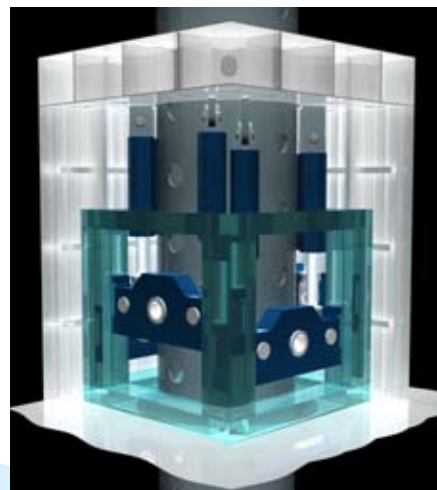


Rack and pinion jacking systems

In the 1970s and 1980s, GustoMSC designed and delivered rack and pinion jacking systems for several jack-up drilling units. These systems represent over 20 years of successful jacking operations. Recently the rack and pinion systems have been modernised with variable speed drives delivered to the NG series and CJ series of drilling rigs, ranging from 80 to 420 tonnes jacking capacity. Over 20 units have been outfitted with GustoMSC rack and pinion jacking systems.

GustoMSC fixation systems

The patented GustoMSC fixation system provides a clearance-free, rigid connection between the leg and platform during operation and transport. This enhances the water depth capability as well as the fatigue life of the jack-up. Over 22 jack-ups are fitted with GustoMSC fixation systems.



Hydraulic positive engagement jacking systems

For construction units, exploration and production jack-up units and self-propelled well-maintenance units, GustoMSC designs and supplies heavy duty hydraulic jacking systems for truss type and tubular legs. Reusable, low maintenance, and fully designed to adapt to leg deflection, over 50 systems have been delivered to date. In addition to the sturdy hydraulic jacking systems applied on the SEA series, GustoMSC developed the continuous jacking system. The system is primarily for the wind turbine installation units as it enhances the jacking speed.

X-Y cantilever

The cantilever jack-ups of the CJ series are equipped with the patented GustoMSC X-Y cantilever system that combines the cantilever and drill floor structures into one fixed package which can move both longitudinally and transversely relative to the hull of the jack-up. Over 14 jack-ups are fitted with X-Y skidding systems.

Associated Equipment



Main cranes

For the wind turbine installation units, GustoMSC has developed a range of high duty cranes. The cranes for these applications differ from standard cranes as the horizontal outreach and lifting height are very specific design requirements. With a horizontal outreach of about 30 m, the crane hook can reach a height of over 80 m from the heel point. Depending on the owner's preference, the crane can be fitted on a pedestal or on top of one of the jackhouses 'wrapped' around the leg. This latter arrangement improves the efficiency of the crane operation and also enhances the available net deck area. The cranes can be delivered as hydraulic driven or electric driven, as the client prefers. The cranes available range from 500 to 1,200-tonne lifting capacity.

Type	GCC-500	GCC-800	GLC-800	GLC-1000	GLC-1200
Number built or under construction	2	-	3	2	-
Main hoist	500 t @ 31 m	800 t @ 30 m	800 t @ 24 m	1,000 t @ 25 m	1,200 t @ 30 m
Vertical reach above heel point	96 m	90 m	77 m	79 m	81.5 m
Auxiliary hoist	160 t @ 70 m	50 t @ 98 m	50 t @ 91 m	160 t @ 70 m	100 t @ 95 m
Drive	Hydraulic	Hydraulic	Electric	Electric	Electric
Power	1,600 kW	1,500 kW	1,600 kW	2,000 kW	2,000 kW
Type	Pedestal	Pedestal	Wrap around	Wrap around	Wrap around





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This document was printed in accordance with the Forest Stewardship Council and the European Programme of Forestation

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