

# ADVANCES IN JACK-UP TECHNOLOGY

20 APRIL 2016, SINGAPORE  
CONFIDENTIAL INFORMATION - PATENT PENDING



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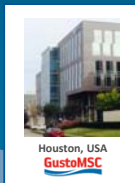
GustoMSC Proprietary Information - 2016

## CONTENTS

1. GUSTOMSC INTRODUCTION
2. ADVANCES IN JACK-UP TECHNOLOGY:
  - A) EQUIPMENT - SMART CRANE
  - B) DESIGNS - CJ43 & NG-3500X



# GUSTOMSC OFFICES



Houston, USA



Houston



Schiedam, the Netherlands

Schiedam



# GUSTOMSC INTRODUCTION

Exploration



Construction



Production



Jack-up



Semi-submersible



Vessel



# GUSTOMSC - INTRODUCTION

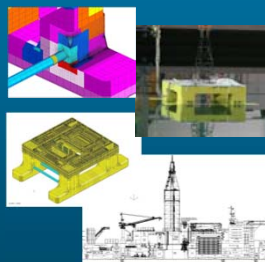
## Designs Of Mobile Offshore Units



## Associated Equipment



## Engineering & Consultancy



## Customer Service



## DRILLING JACK-UP BUILDING BOOMS

### 1980's:

3 & 4-legged units / Slot & Cantilever / Mat & Independent Legs from

Many designers

*LeTourneau*

*Friede&Goldman*

*MSC*

*Various Shipyards (Mitsubishi, Mitsui, CFEM, Hitachi Zosen, Gusto, etc)*

### 2010's:

3-legged units / Cantilever / Independent Legs from

Few designers

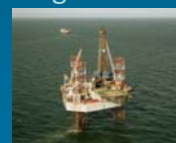
*GustoMSC*

*KeppelFels*

*Cameron/LeTourneau*

*Friede&Goldman*

*Baker Marine*





## GUSTOMSC INNOVATIONS

1985: X-brace leg design

2000: X-Y cantilever

2003: VFD Fixation system

2005: VFD Jacking system



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## RESULTS:



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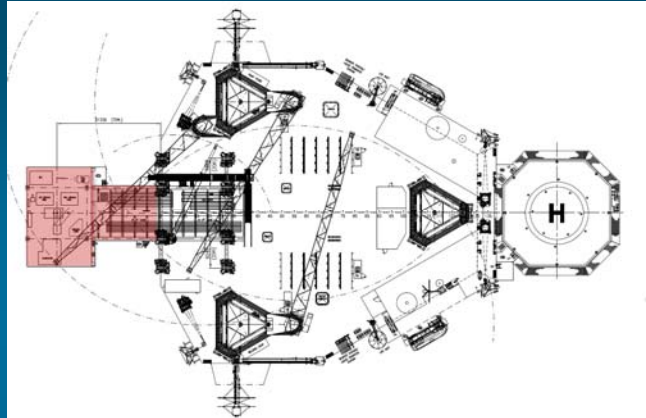
# SMART CRANE

GROWING NEED FOR P&A WORK  
INDUSTRY: REDUCE COSTS

BUT HOW?

ONLY SINGLE OPERATION POSSIBLE IN WELL CENTER  
AREA BELOW CANTILEVER ALWAYS BLOCKED FROM MAIN CRANES

SOLUTION → SIMULTANEOUS OPERATIONS  
(SIMOPS)

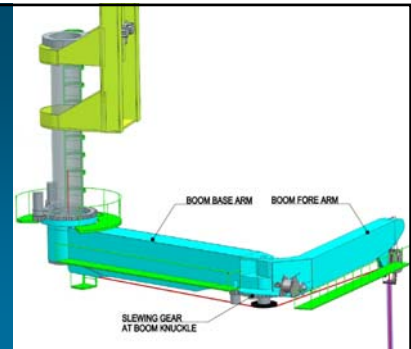


# SMART CRANE

## DESCRIPTION

Horizontal knuckle boom crane  
Mounted at SB side of cantilever  
Ability to vertically move as one piece with load  
It provides:

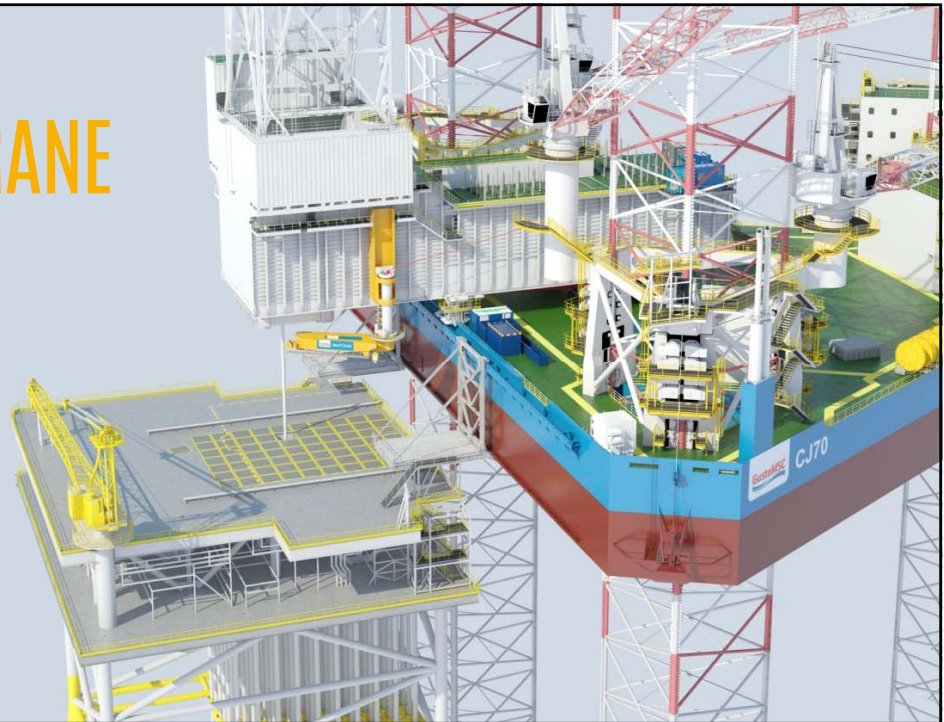
- A hoisting system which can be positioned underneath the cantilever independently of the well center and also reach main deck
- Dual winch arrangement to :
  - support a wireline operation (main load and limited tensioning)
  - provide material handling capabilities





# SMART CRANE

ADJACENT TO UNMANNED  
WELLHEAD PLATFORM



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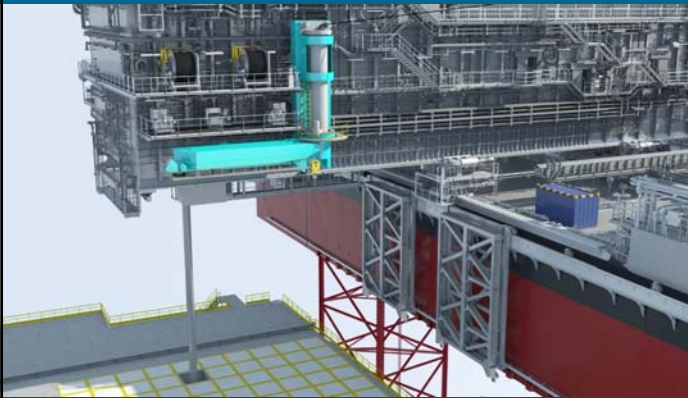


Confidential, Patent Pending



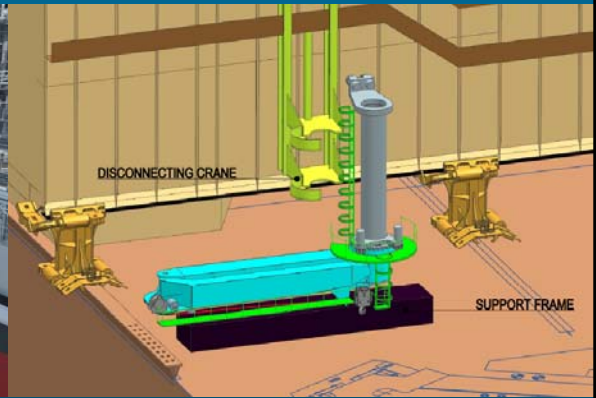
# SMART CRANE

OTHER FUNCTIONALITIES



PARKED POSITION

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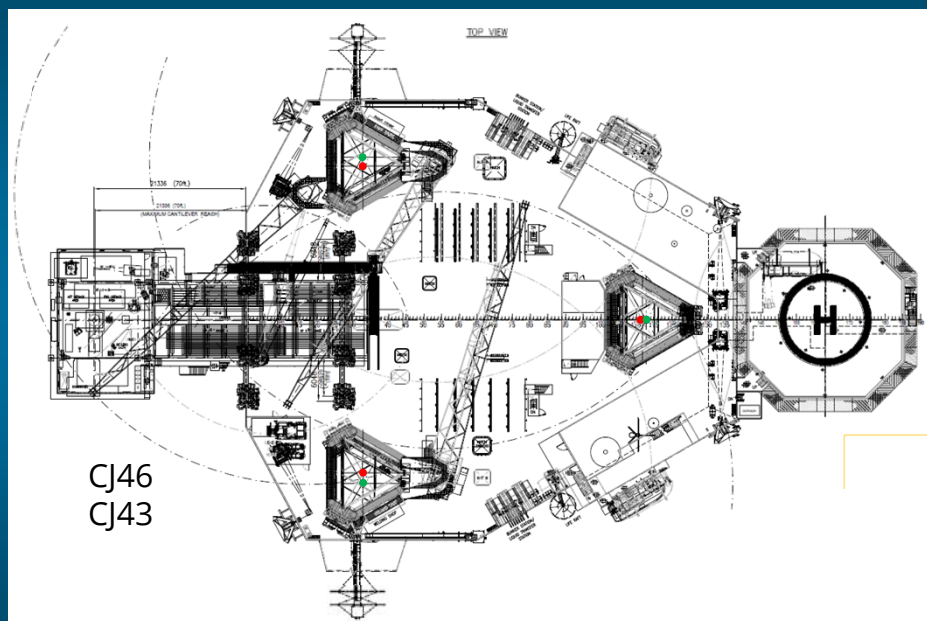
DISCONNECTED



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## LeT116E:

Shale shakers on main deck (CJ43: inside X-Y cantilever)

P-tanks on main deck (CJ43: in hull)

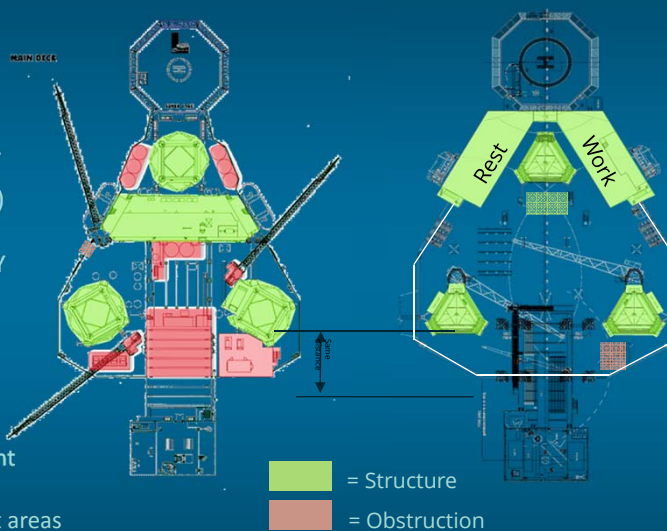
BOP (handling) / Conductor tensioning (CJ43: inside X-Y cantilever)

## CJ43:

No flexibles between main deck and cantilever, all connections through drag chains

All mud processing equipment inside cantilever, efficient routing of return mud and treatment (degassing etc)

Wrap-around accommodation → separated work / rest areas



Effectively 100% larger usable deck area



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# GUSTOMSC NG-SERIES / MULTIPURPOSE

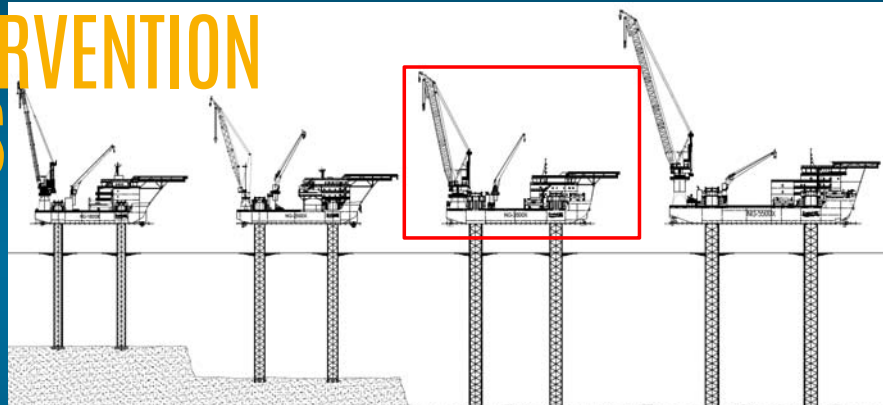
## SELF PROPELLED JACK-UPS



No.	Name	Series	Owner	Yard	Year
1	Wind Lift 1	NG-5300	Bard	Western Shipyard	2009
2	Seajacks Kraken	NG-2500X	Seajacks UK Ltd	Lamprell	2009
3	Seajacks Leviathan	NG-2500X	Seajacks UK Ltd	Lamprell	2009
4	GMS Endeavour	NG-2500X	GMS	GMS	2010
5	GMS Endurance	NG-2500X	GMS	GMS	2010
6	MPI Adventure	NG-7500-6	MPI Offshore	COSCO	2011
7	MPI Discovery	NG-7500-6	MPI Offshore	COSCO	2011
8	Neptune	NG-2750	GeoSea	IHC	2012
9	SEP-450	NG-2500X	NPCC	NPCC	2012
10	Seajacks Zoratan	NG-5500X	Seajacks Ltd	Lamprell	2012
11	Brave Tern	NG-9000C	Fred Olsen Windcarrier	Lamprell	2012
12	Sea Installer	NG-9000C	A2SEA	COSCO	2012
13	Bold Tern	NG-9000C	Fred Olsen Windcarrier	Lamprell	2013
14	Sea Challenger	NG-9000C	A2SEA	COSCO	2014
15	GMS Enterprise	NG-2500X	GMS	GMS	2014
16	Seajacks Hydra	NG-2500X	Seajacks UK Ltd	Lamprell	2014
17	SEP-550	NG-2500X-NP	NPCC	NPCC	2014
18	Seajacks Scylla	NG-14000X	Seajacks UK Ltd	Samsung	2015
19	GMS Phoenix	NG-1800X	GMS	GMS	2015
20	GMS Scorpion	NG-1800X	GMS	GMS	2015
21	GMS Shores	NG-1800X	GMS	GMS	2015
22	SEP-850	NG-2500X-TB	NPCC	ZPMC	2016
23	SEP-750	NG-2500X-NP	NPCC	ZPMC	2016
24	Avon	NG-2500X	Vahana Offshore	Eversendal	2016
25	Arian	NG-2500X	Vahana Offshore	Eversendal	2016
26	TBN	NG-2500X	TBA	TBA	2016
27	GMS Evolution	NG-2500X	GMS	GMS	2016
28	Apollo	NG-5500X	GeoSea	Ullrich	2017



# WELL-INTERVENTION SOLUTIONS



	NG-1800X	NG-2500X	NG-3500X	NG-5500X	NG-5500X
Type of operations	WI	WI	WI/LD	LD	WI
Cantilever reach longitudinal	TBD	12.2 m (40 ft)	15.2 m (50 ft)	15.2 m (50 ft)	20 m (65 ft)
Cantilever reach transverse	TBD	3.0 m (10 ft)	3.6 m (12 ft)	3.6 m (12 ft)	4 m (13 ft)
Cantilever combined load (full envelope)	TBD	160 mt (350 kips)	227 mt (500 kips)	360 mt (800 kips)	200 mt (440 kips)

- WI = (Light) Well Intervention/Servicing, i.e. coiled tubing & wire lining (no tubulars intended)
- LD = Light Drilling, ESP pulling, heavy well intervention/servicing (tubulars and possibly well control)



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# DRILLING CAPACITIES

HEAVY WELL INTERVENTION & LIGHT DRILLING CAPABILITY

CANTILEVER DIMENSIONS (BOX) 40 X 6.0 X 7.5/9.0 m

COMBINED LOAD AT 50 ft. ± 227 t / 500 kips

COMBINED LOAD AT 35 ft. ± 363 t / 800 kips

TOP DRIVE CAPACITY ± 227 t / 500 kips

MAX DRILLING DEPTH ± 12000 ft

AREA OF OPERATION SOUTH-EAST ASIA & ARABIAN GULF

OPTIONAL WIRE LINE & COILED TUBING



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NG-3500X-LD

# BEST-IN-CLASS SOLUTION FOR HEAVY WELL INTERVENTION



VARIABLE  
LOAD MAX  
1,250 T

LEG DESIGN  
**STURDY  
X-BRACING**

FREE DECK SPACE  
FOR MISSION EQUIPMENT  
1,000 M<sup>2</sup>

FAST &  
AUTONOMOUS  
POSITIONING  
**DP2**

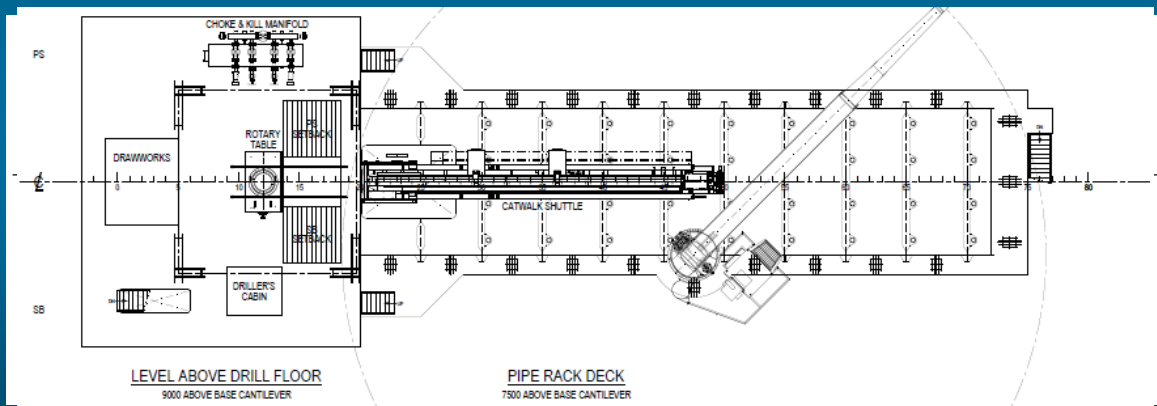
COMBINED LOAD AT  
FULL TRANSVERSE  
REACH  
**227 T**  
500 KIPS

CANTILEVER  
REACH  
**15.2 X 7.3 M**  
50 X 24 FT





# GENERAL LAYOUT - CANTILEVER



# PROOF OF CONCEPT - SWIFT 10





# THANK YOU FOR YOUR KIND ATTENTION

20 APRIL 2016, SINGAPORE



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