

LIFT BOATS: EXPLORING MARKET TRENDS FOR LIFTBOATS

Offshore Vessel & Rig Connect ASIA,
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Prepared by:

Jose George,

General Manager, Singapore

ARIES MARINE & ENGG SERVICES,
SINGAPORE



ARIES GROUP

- Established in **1998**
- Founder, CEO - Mr. Sohan Roy , Marine Engineer - Naval Architect
- Started operations with 5 employees, in Sharjah UAE
- ISO certified by DNV in 2003
- By 2013, we have grown to **31** group companies
- Interests in Engineering, Survey, Media, Training, Research & Development, Television, Tourism, Movies, Interior Design
- Over **850** employees worldwide
- Offices in **11** Countries - UAE, Bahrain, Qatar, India, Singapore, United States, Azerbaijan, China, Saudi Arabia, Malaysia, Oman
- Head quartered in the United Arab Emirates – with around 500 employees and offices in 5 emirates – Sharjah, Abudhabi, Dubai, Fujairah and Ras Al Khaimah

ARIES GROUP - Services

Naval Architecture, Engineering & Marine Consultancy

Offshore Engineering

Project Management & Survey / 3D scanning

Ultrasonic Thickness Gauging

Hull Integrity & RBI Inspections

Conventional and Advanced N.D.T. Services

Inspection & Testing Services

Rope Access Services

Corrosion Control Services

Signage Survey/Marking Services

Yacht Interiors Design

Audit & Marine Technical Documentation

Electrical & Instrumentation



AGENDA

- LIFTBOATS: FEATURES
- TRENDS
- UTILIZATION
- DESIGN CONSIDERATIONS
- TYPICAL LIFTBOAT SERIES
- ADVANTAGES
- RULES AND REGULATIONS
- MARKET POTENTIAL
 - INTERNATIONAL MARKET



LIFTBOATS: FEATURES

A product of
Aries Offshore Engineering Division

ARION
Lift Boat Series
Lifting Expectations !

LB 2540 LB 4580 LB 8512

LB 2540		LB 4580		LB 8512	
Max. Water Depth	: 25 m	Max. Water Depth	: 45 m	Max. Water Depth	: 85 m
Length	: 30 m	Length	: 45 m	Length	: 82 m
Breadth	: 19 m	Breadth	: 25 m	Breadth	: 40 m
Depth	: 3.5 m	Depth	: 4.0 m	Depth	: 6.0 m
Leg Length	: 40 m	Leg Length	: 80 m	Leg Length	: 120 m
Deck Area	: 200 m ²	Deck Area	: 450 m ²	Deck Area	: 1500 m ²
Accommodation	: 62 Persons	Accommodation	: 120 Persons	Accommodation	: 220 Persons

- SELF PROPELLED
- SELF ELEVATING
- LARGE OPEN DECK SPACE
- MULTI PURPOSE
- EQUIPPED WITH CRANE
- STABLE PLATFORM FOR OFFSHORE CONSTRUCTION & MAINTENANCE
- CAPABLE OF CARRYING EQUIPMENT AND SUPPLIES



LIFTBOATS: FEATURES

LIFTBOATS:

- SELF PROPELLED
- SELF ELEVATING
- GENERALLY NOT “MODU” COMPLIANT

IS DIFFERENT FROM

DRILLING JACKUP RIGS:

- MODU COMPLIANT
- LONG ELEVATED OPERATIONS
- NON-PROPELLED

SELF ELEVATING PONTOONS:

- NON-PROPELLED
- ACCOMMODATION OR CRANE SUPPORT
- UNMANNED DURING TRANSIT



LIFTBOATS: VERSATILITY

- LIFTBOAT: AN OSV WITH MOVEABLE LEGS CAPABLE OF RAISING ITS HULL ABOVE THE SURFACE OF THE SEA. (Ref# USCG)
- COMBINES CAPABILITIES OF,
 - CONVENTIONAL CRANE/DECK BARGE,
 - THE LEGS AND JACKING SYSTEM OF THE MODU,
 - THE PROPULSION OF THE STANDARD WORKBOAT/OSV
- A LOW-COST ALTERNATIVE FOR A WIDE ARRAY OF OFFSHORE JOBS



LIFTBOATS: TRENDS

ORIGIN

- ORIGINATED IN US (1950s)
- LEGS ELEVATED BY CABLES and PULLEYS
- SEISMOGRAPHIC SURVEYS/ SUPPORT FOR THE FIXED PLATFORMS
- TYPICAL FOUR LEGGED

GROWTH

- LEGS OF 150-FT AND LESS WERE BUILT IN THE MID-1970s TO LATE 1980s
- INTRODUCTION OF HYDRAULICS and RACK & PINION JACKING SYSTEMS
- 3-LEGGED CONCEPT
- ELECTRICAL JACKING SYSTEMS
- NOT VERY POPULAR OUTSIDE GoM



LIFTBOATS: TRENDS

PRESENT

- APPROX 250 UNITS IN GoM; APPROX 300 UNITS WORLDWIDE
- LIFTBOATS WITH MORE THAN 150-FT LEGS HAVE BEEN BUILT SINCE THE MID 1990's.
- WITH INCREASED WATER DEPTHS, ABILITY TO ACCESS OFFSHORE PLATFORMS INCREASED
- INCREASED DEMAND GLOBALLY; NOW USED IN WEST AFRICA, THE PERSIAN GULF, SOUTH EAST ASIA AND THE NORTH SEA

FUTURE

- PREFERRED OPTION FOR OFFSHORE PLATFORM SERVICES
- NEW GENERATION LIFTBOATS FOR GREATER WATER DEPTHS AND SEVERE OPERATING CONDITIONS.
- REACH OVER WIDER RANGE OF PLATFORMS



LIFTBOATS: UTILIZATION

➤ TYPICALLY USED FOR THE FOLLOWING ACTIVITIES

- MAINTENANCE AND REPAIRS OF OFFSHORE PLATFORMS
- CONSTRUCTION OF OFFSHORE PLATFORMS
- REMOVAL OF OLD PLATFORMS
- WIND FARM INSTALLATION AND MAINTENANCE
- WELL INTERVENTION
- OFFSHORE COMMISSIONING
- ACCOMMODATION UNITS
- WELL ABANDONMENT AND DECOMMISSIONING
- DIVING SUPPORT ACTIVITIES



LIFTBOATS: DESIGN STRATEGIES

➤ TRADITIONAL DESIGNS BASED ON “HIT AND RUN” STRATEGY

- NOT DESIGNED TO SUSTAIN SEVERE STORM
- HAVE TO OPERATE NEAR SHORE (12 to 24 HRS AWAY FROM SAFE REFUGE)
- LIGHTER CONSTRUCTION: LOW CAPEX
- LESS UPTIME: HIGH OPEX
- OPERATIONAL WEATHER WINDOW: SENSITIVE TO REGIONS (eg: NORTH SEA)

➤ NEW GENERATION DESIGNS BASED ON ALL WEATHER CRITERIA

- DESIGNED FOR SURVIVAL STORM AT LOCATION
- LIMITS INTERRUPTIONS OF OPERATIONS
- CAN OPERATE FURTHER OFFSHORE LOCATIONS
- ENHANCED OPERATIONAL ENVELOPE: LOW OPEX
- HEAVIER CONSTRUCTION COMPARED TO TRADITIONAL : HIGH CAPEX
- HIGHER SAFETY STANDARDS

LIFTBOATS: DESIGN CONSIDERATIONS



LEGS

- MOSTLY 3 or 4 LEGGED
- TUBULAR LEGS FOR SHALLOW WATERS,
- LATTICE LEGS RECOMMENDED ABOVE 65m WATER DEPTH
- FOUR LEGGED IS FASTER, HOWEVER COSTS MORE
- SPUD CANS/PAD DESIGNS DEPENDS ON LEG PENETRATIONS, BEARING PRESSURES etc.



LIFTBOATS: DESIGN CONSIDERATIONS



JACKING SYSTEMS

- HIGHER JACKING SPEED. JACK UP @ 4 FT/MIN, JACK DOWN 16 FT/MIN
- HIGHER OPERATIONAL CYCLES
- HIGHER WEAR AND SHOCK FACTORS FOR JACKING SYSTEM DESIGN



LIFTBOATS: DESIGN CONSIDERATIONS



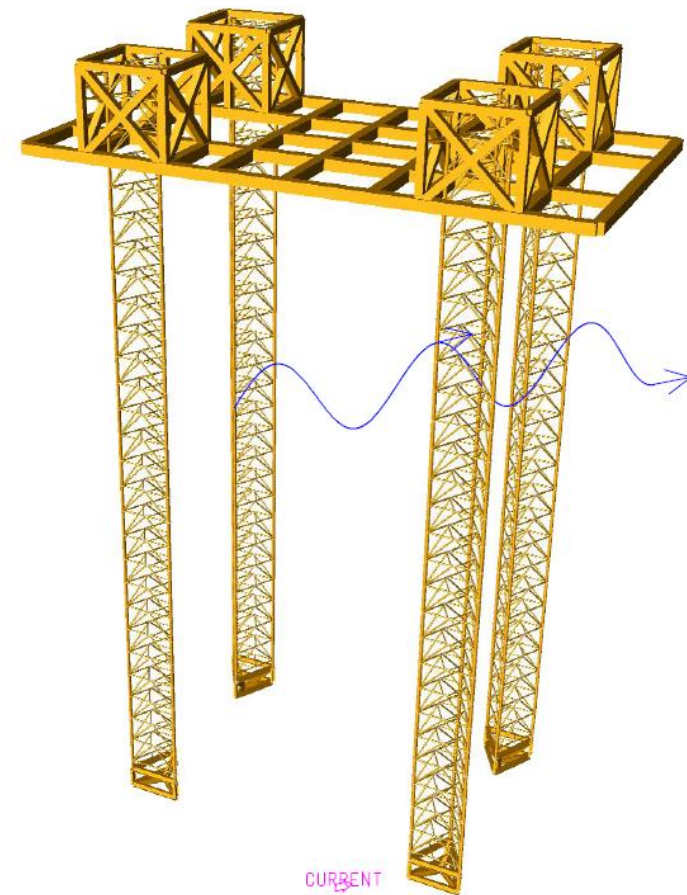
OTHER FACTORS

- WATER DEPTH
- OPTIMIZATION OF DECK AREA,
- DECK LOAD CAPACITY
- CRANE CAPACITY
- ACCOMMODATION
- PROPULSION
- DYNAMIC POSITIONING
- CLASS CERTIFICATION

LIFTBOATS: DESIGN CONSIDERATIONS

DESIGN ANALYSES

- VARIOUS OPERATING CONDITIONS
- ENVIRONMENTAL LOADS/LIMITATIONS
- GLOBAL/LOCAL ANALYSES
- FATIGUE, DYNAMIC LOADS
CONSIDERED
- FLOATING AND ELEVATED STABILITY








LIFTBOATS: TYPICAL SERIES

A product of
Aries Offshore Engineering Division

ARION
Lift Boat Series
Lifting Expectations !

LB 2540	LB 4580	LB 8512
		
Max. Water Depth : 25 m Length : 30 m Breadth : 19 m Depth : 3.5 m Leg Length : 40 m Deck Area : 200 m ² Accommodation : 62 Persons	Max. Water Depth : 45 m Length : 45 m Breadth : 25 m Depth : 4.0 m Leg Length : 80 m Deck Area : 450 m ² Accommodation : 120 Persons	Max. Water Depth : 85 m Length : 82 m Breadth : 40 m Depth : 6.0 m Leg Length : 120 m Deck Area : 1500 m ² Accommodation : 220 Persons

COURTESY ARIES R&D DIVISION



LIFTBOATS: LB 2540



Design Specifications		Jacking System	
Water Depth	25 m	Jacking System	Rack and Pinion type
Total Elevated Load	800 T	Cranes	
Variable Deck Load	100 T	Main Crane	
Air Gap	3.0 m	Pedestal Type	
Leg Penetration	1.0 m	SWL 45 T @ 3m radius	
Class Notation	ABS, A1 Liftboat, AAMS	Pedestal Type	
Functions	Accommodation Vessel, Well maintenance, Hookup, Work over	SWL 9.5 T @2.8m radius	
Design Environment		Accommodation	
<u>Survival Condition</u>		Total Accommodation	62 persons
Max wave Height	3.0 m		1 Man cabins4 nos.
Corresponding Wave Period	6 sec		2 Men cabins8 nos.
Max Wind Speed	50 knots		4 Men cabins10 nos.
Max Current Speed	1 knots	Other facilities	1 no. Hospital (MDK)
<u>Operating Condition</u>			Recreation Room
Max wave Height	2.0 m		Mess Rooms,
Corresponding Wave Period	6 sec		Galley,
Max Wind Speed	30 knots		Change Rooms,
Max Current Speed	1 knots		Laundry
Hull		Propulsion & Powering	
Length	30.0 m	Transit Speed	4 knots
Breadth	19.0 m	Propulsion	2x Main Engines, (approx. 450 KW each), Fixed pitch propellers with rudders
Depth	3.5 m		1x Bow Thruster, (approx. 190 KW)
Deck Area	200.00 m2	Bow Thrusters	3x 265 KW Main Gensets, 1x 50 KW Emergency Genset
Legs		Gensets	
No. of Legs	4 nos		
Type	Cylindrical		
Leg length	40.0 m		
Spud can Type	Rectangular		

LB2540

COURTSEY ARIES R&D DIVISION

LIFTBOATS: LB 4580



Design Specifications

Water Depth	45 m
Total Elevated Load	2000 T
Variable Deck Load	250 T
Air Gap	10.0 m
Leg Penetration	3.0 m
Class Notation	ABS, #A1, Liftboat, #AMS
Functions	Accommodation Vessel Well maintenance Hookup, Work over

Design Environment

<u>Survival Condition</u>	
Max wave Height	6.0 m
Corresponding Wave Period	8 sec
Max Wind Speed	100 knots
Max Current Speed	1 knot
<u>Operating Condition</u>	
Max wave Height	4.0 m
Corresponding Wave Period	6 sec
Max Wind Speed	70 knots
Max Current Speed	1 knot

Hull

Length	45.0 m
Breadth	25.0 m
Depth	4.0 m
Deck Area	450.00 m ²

Legs

No. of Legs	4 nos
Type	Cylindrical
Leg length	80.0 m
Spud can Type	Rectangular

Jacking System

Jacking System	Rack and Pinion type
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Cranes

Main Crane	Pedestal Type SWL 45 T @ 26m radius Pedestal Type SWL 13 T @ 24m radius
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Accommodation

Total Accommodation	120 persons 1 Man cabins : 16 nos. 2 Men cabins : 16 nos. 4 Men cabins : 18 nos.
Other facilities	1 no. Hospital (MDK) Recreation Room Mess Rooms, Galley Change Rooms Laundry

Propulsion & Powering

Transit Speed	8 knots
Propulsion	2 x Azimuth Thrusters, L Drive (approx. 80 KW)
Bow Thrusters	1 x Bow Thruster (approx. 450KW)
Gensets	3x 1180 KW Main Gensets 1x 150 KW Emergency Genset

Helideck

Type	Bell-412
D Value	17 m
Maximum Take off Mass	5.4 T
Design Standard	UK CAA CAP437

LB4580

COURTESY ARIES R&D DIVISION



LIFTBOATS: LB 8512



Design Specifications

Water Depth	85 m
Total Elevated Load	6500 T
Variable Deck Load	1500 T
Air Gap	15.0 m
Leg Penetration	3.0 m
Class Notation	ABS, * A1, Self-Elevating Unit, * AMS, CRC
Functions	Accommodation Vessel, Well maintenance, Hookup, Work over

Design Environment

<u>Survival Condition</u>	
Max wave Height	10.0 m
Corresponding Wave Period	10 sec
Max Wind Speed	100 knots
Max Current Speed	2 knot
<u>Operating Condition</u>	
Max wave Height	6.0 m
Corresponding Wave Period	8 sec
Max Wind Speed	70 knots
Max Current Speed	2 knot

Hull

Length	82.0 m
Breadth	40.0 m
Depth	6.0 m
Deck Area	1500.00 m ²

Legs

No. of Legs	4 nos
Type	Truss Construction
Leg length	120.0 m
Spud can Type	Circular

Jacking System

Jacking System	Rack and Pinion type
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Cranes

Main Crane	Leg Encircling SWL 270 T @ 20m radius Pedestal Type SWL 50 T @ 14m radius
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Accommodation

Total Accommodation	220 persons 1 Man cabins : 40 nos. 2 Men cabins : 40 nos. 4 Men Cabins : 25 nos. 1 no. Hospital (MDK) Office Room, Recreation Rooms, Mess Rooms, Galley, Change Rooms, Laundry
Other facilities	

Propulsion & Powering

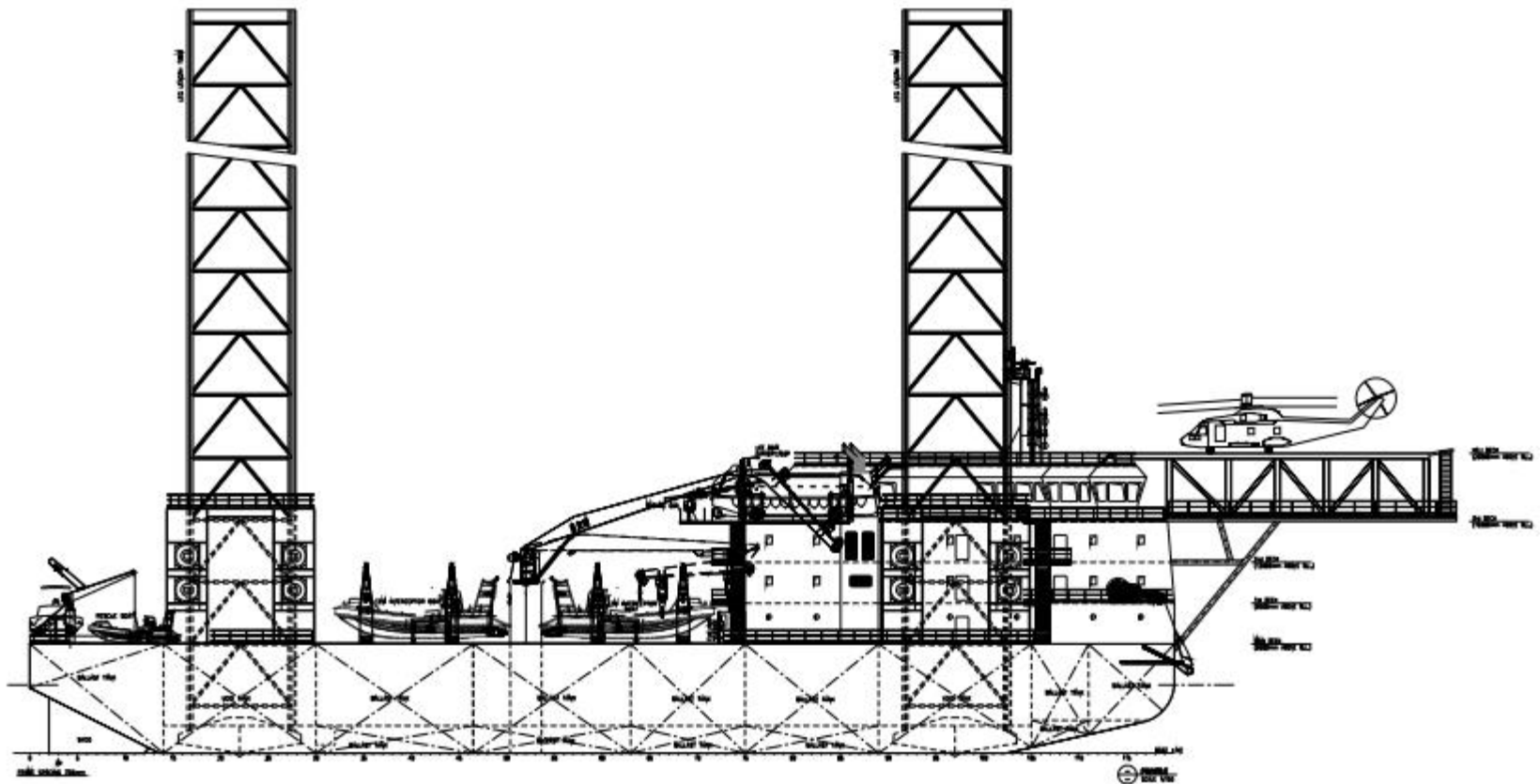
Transit Speed	5 knots
Propulsion	3x Azimuth Thrusters, L Drive (approx. 880 KW) 1x Azimuth Thrusters, (approx. 500 KW)
Bow Thrusters	3x 1500 KW Main Gensets 1x 500 KW Emergency Genset
Gensets	

Helideck

Type	S-61, S-92
D. Value	22.2 m
Maximum Take off Mass	12.6 T
Design Standard	UK CAA CAP437

COURTSEY ARIES R&D DIVISION

LIFTBOATS: LBD100



COURTESY ARIES R&D DIVISION



LIFTBOATS: ADVANTAGES

- SAFE PLATFORM IN HARSH ENVIRONMENTS
- MORE EFFICIENT AND SAFER THAN A FLOATING WORKBOAT/CRANE VESSEL
- MULTI FUNCTIONAL
- LOWER DOWNTIME
- NO TOWING AND MOORING ASSISTANCE DURING OPERATION
- LOWER MOBILIZATION COST
- MORE COMPETITIVE IN THE MARKET IN TERMS OF BUILDING COST AND CHARTER RATES



LIFTBOATS: RULES AND REGULATIONS

CLASSIFICATION SOCIETY RULES:

ABS	For Hull Length < 61 m and Leg Length < 91.44 m	Guide for Building and Classing Liftboats
ABS	For Hull Length \geq 61 m or Leg Length > 91.44 m	Guide for Building and Classing Mobile Offshore Units
LR	Rules and Regulations for the Classification of Offshore Units.	
BV	Rules for classification of Offshore Units (NR445) Rules for classification of Liftboats (Target pub: 1 st half 2016)	
DNV GL	Rules for classification, Offshore units DNVGL-RU-OU-0104 – Edition July 2015, Self-elevating units)	
RINA	Rules for the Classification of Floating Offshore Units at Fixed Locations and Mobile Offshore Drilling Units	

IN GENERAL THE DESIGN OF LEGS AND JACKING SYSTEM REFER TO THE MODU RULES and OTHER SYSTEMS REFER TO VESSEL RULES



LIFTBOATS: RULES AND REGULATIONS

OTHER REQUIREMENTS:

- MODU CODE
- SOLAS
- FLAG STATE REQUIREMENTS
- PORT STATE REQUIREMENTS
- CHARTERER REQUIREMENTS

STANDARDS AND GUIDELINES:

SNAME 5-5A	Guidelines for Site Specific Assessment of Mobile Jack-Up Units
IACS UR D 2012	International Association of Classification Societies Unified Requirements concerning Mobile Offshore Drilling Units
API RP 2A-WSD 2014	Recommended Practice for Planning, Designing, and Constructing Fixed Offshore Platforms
ISO/DIS 19905-1 2012	Petroleum and natural gas industries - Site-specific assessment of mobile offshore units – Part 1: Jack-ups



LIFTBOATS: MARKET POTENTIAL

- DEMAND FOR SEUs IN ASIA PACIFIC, MIDDLE EAST AND AFRICA REMAINS STRONG, DUE TO AGING PLATFORMS AND INCREASING OFFSHORE CONSTRUCTION ACTIVITY.
- MARKET OUTSIDE AMERICA REGIONS ARE RELATIVELY UNPENETRATED.
- NORTH AMERICA HAS APPROX 250 LIFTBOATS SERVICING 3,200+ FIXED PLATFORMS.
i.e. 1 SEU : 13 PLATFORMS.
- SOUTHEAST ASIA (SEA), INDIA, MIDDLE EAST AND WEST AFRICA HAS APPROX 60 SEUs AGAINST 3200+ FIXED PLATFORMS i.e 1 SEU: 53 PLATFORMS.



LIFTBOATS: MARKET POTENTIAL

- LOWER OIL PRICE. DEMANDING MAX UTILISATION OF MATURED PLATFORMS HAVING MINIMUM PRODUCTION COSTS
- OLD PRODUCTION PLATFORMS REQUIRE MAINTENANCE AND MODIFICATIONS.
- LARGE NUMBER OF FIELD MOVES POSSIBLE DUE TO THE PROPULSION ARRANGEMENT.

LIFTBOATS: INTERNATIONAL MARKET

NORTH AMERICA

- OVER 3000 FIXED PLATFORMS TO BE SERVICED IN SHALLOW WATER

SOUTH EAST ASIA

- MATURING OIL FIELDS IN SHALLOW WATER
- OLD PLATFORMS TO BE REMOVED

INDIA

- ENHANCED OIL RECOVERY ACTIVITIES PLANNED BY ONGC
- LIFE EXTENSION OF PLATFORMS

WEST AFRICA

- MATURING OIL FIELDS IN SHALLOW WATER

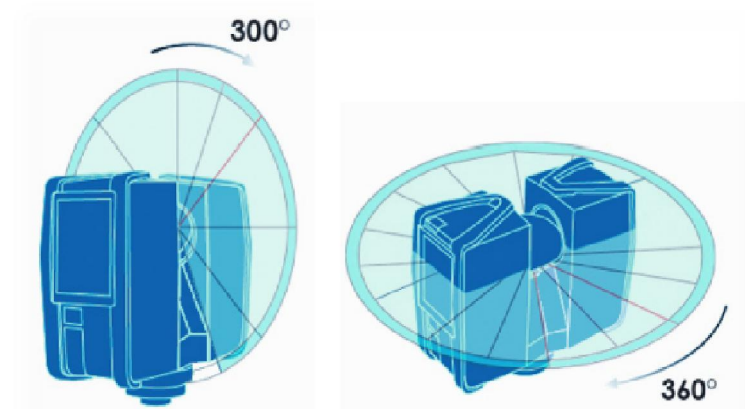


Figure 1-3 Vertical and Horizontal Rotation



LIFTBOATS: INTERNATIONAL MARKET

DECOMMISSIONING WORLD-WIDE

GULF OF MEXICO:

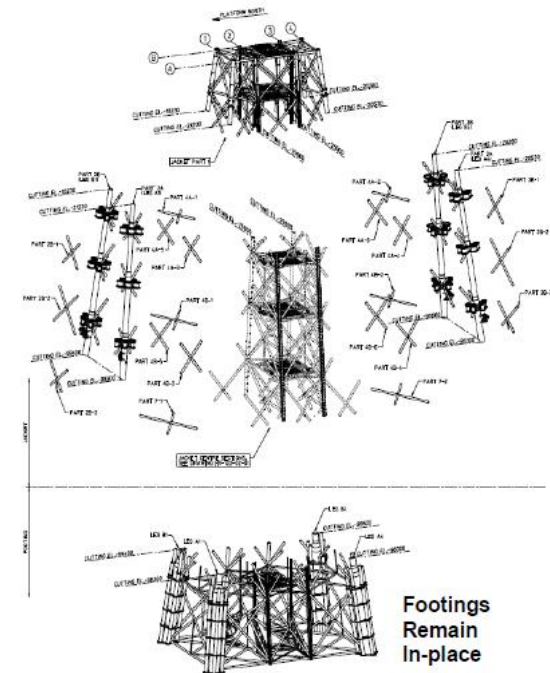
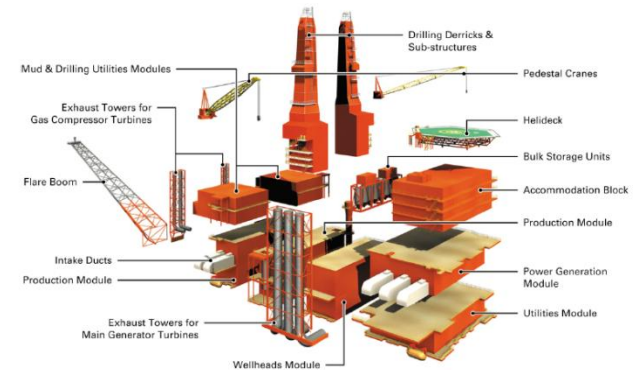
- CURRENT TREND SHOWS YEARLY REMOVAL OF APPROX. 150-200 PLATFORMS
- DECOMMISSIONING MARKET VALUED \$30-\$40 BILLION

ASIA PACIFIC:

- OVER 1700 PLATFORMS, 95% FIXED PLATFORMS
- LESS THAN 10% PLATFORMS REMOVED SO FAR
- DECOMMISSIONING MARKET VALUED \$15-\$30 BILLION

UKCS:

- OVER 600 PLATFORMS
- LESS THAN 10% PLATFORMS REMOVED SO FAR
- DECOMMISSIONING MARKET VALUED APPROX. \$50 BILLION



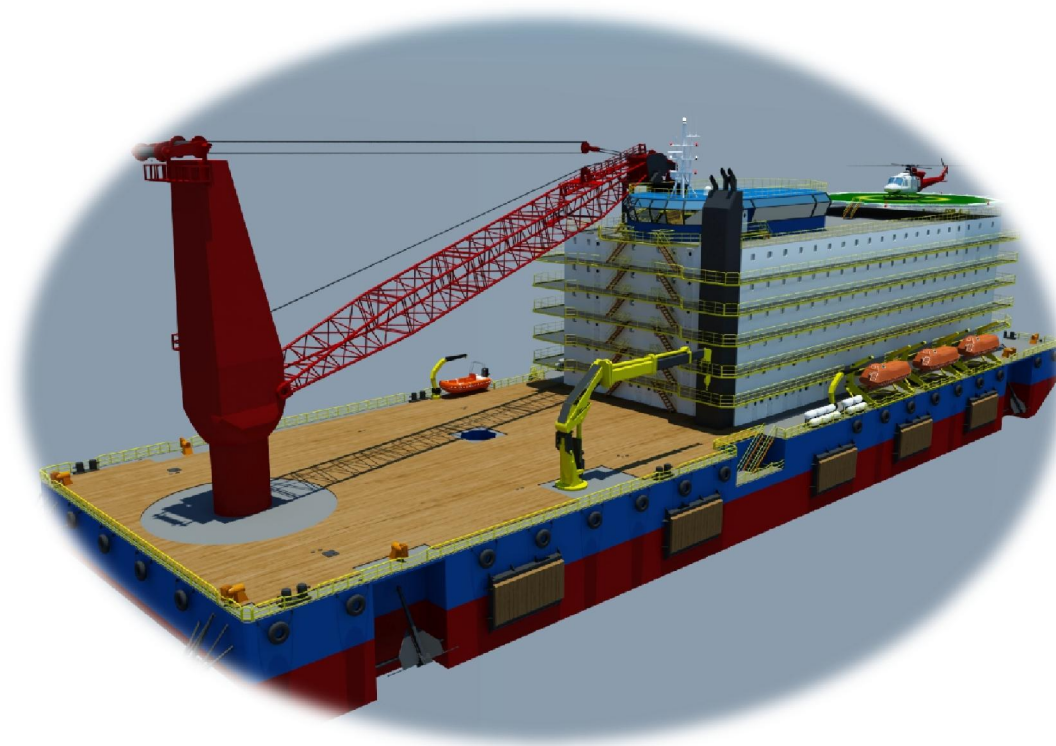
Present Offshore Market – South East Asia

- · 8 construction/new build contracts cancelled
- 25 have now been stacked
- 15 heading to scrapyards
- 117 jackups ordered and still under construction, of which 99 have no contracts
- 10 tender rigs under construction with nowhere to go
- 212 of the worldwide offshore drilling fleet of 833 are idle and out of work, with 173 new rigs due to enter the market in the next 12 months

Source: Icarus, Rigzone, Acia Pacific Offshore Reprots.

Present Liftboat Market in South East Asia

- As of 2015, charter rates trended around the \$40,000 – \$80,000 mark a day, now dropping down to day rates between \$24,000 –\$57,000
- Cost to build ranged from \$50m to \$100m, now starting at US\$30m mark
- Significant discounts offered to buyers to take over build contracts, in some cases up to 15%
- Increased number of mid-range liftboats now being offered on the open bid market
- Scaling back of offshore capex, for example Petronas cutting back by 20%
- Credit Suisse reports have scaled down the need for liftboats in the SE Asia region from 80 to 50 in the last six months (due to lower capex, improved efficiency etc)
- Major declines in international liftboat utilisation (down to 37%) could lead to market incursion
- 22 current newbuilds in SE Asia, with only 10 having contracts



THANK YOU