

# LIFT BOATS: ROLE IN PROVIDING VERSATILE OFFSHORE SUPPORT SERVICES

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Prepared by:

ROBIN SYRIAC,

MANAGER (OFFSHORE ENGG.)

ARIES MARINE & ENGG SERVICES,

SHARJAH



## AGENDA

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





## LIFTBOATS: FEATURES

**ARION**  
Lift Boat Series  
*Lifting Expectations!*

A product of  
Aries Offshore Engineering Division

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	28 m	Breadth	40 m
Depth	3.5 m	Depth	4.0 m	Depth	6.0 m
Log Length	40 m	Log Length	80 m	Log Length	120 m
Deck Area	200 m <sup>2</sup>	Deck Area	400 m <sup>2</sup>	Deck Area	1500 m <sup>2</sup>
Accommodation	60 Persons	Accommodation	100 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

Source: Oil & Gas Journal



## 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

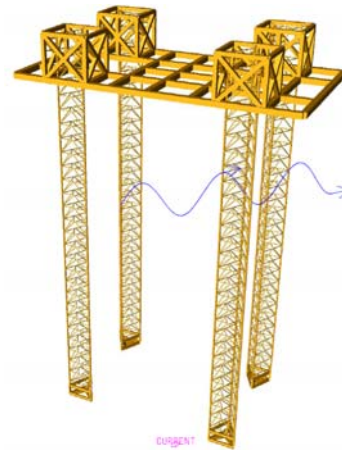
- WATER DEPTH
- OPTIMIZATION OF DECK AREA,
- DECK LOAD CAPACITY
- CRANE CAPACITY
- ACCOMMODATION
- PROPULSION
- DYNAMIC POSITIONING
- CLASS CERTIFICATION



## 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		
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 <sup>2</sup> Accommodation : 62 Persons	Max. Water Depth : 45 m Length : 45 m Breadth : 25 m Depth : 4.5 m Leg Length : 80 m Deck Area : 450 m <sup>2</sup> Accommodation : 120 Persons	Max. Water Depth : 85 m Length : 62 m Breadth : 40 m Depth : 6.5 m Leg Length : 120 m Deck Area : 7500 m <sup>2</sup> Accommodation : 220 Persons

COURTESY ARIES R&D DIVISION



## LIFTBOATS: LB 2540



Design Specifications	
Water Depth	25 m
Total Decked Load	800 T
Variable Deck Load	120 T
Air Gap	1.8 m
Log Dimension	2.5 m
Cable Protection	ARL, WGL, E-Blocker, WMS
Functions	Accommodation vessel Well intervention Hoisting, Work over
Design Environment	
Survival Conditions	
Water wave height	3.0 m
Corresponding wave period	8 sec
Max Wind Speed	55 knots
Max Current Speed	3 knots
Operational Conditions	
Water wave height	2.0 m
Corresponding wave period	6 sec
Max Wind Speed	40 knots
Max Current Speed	1 knots
Hull	
Length	25.0 m
Beam	10.0 m
Depth	2.5 m
Block area	220.00 m <sup>2</sup>
Legs	
No. of legs	4 nos
Type	Cylindrical
Leg length	40.0 m
Spread out type	Rectangular
Jacking System	
Jacking System	Back and Pivotal type
Cranes	
Main Crane	Hydraulic Type DWS, 45 T, 40 m radius Protection Type DWS, 5.5 T, 60 m radius
Accommodation	
Total Accommodation	62 persons
	2 Main cabins, 18 nos
	2 Main cabins, 18 nos
	4 Main cabins, 18 nos
Other facilities	3 no. Hospital (BON) Recreation Room Mess Room Galleys Change Rooms Laundry
Propulsion & Powering	
Turned Speed	4 knots
Propulsion	2x Main Engines Inertia, 450 KW each Hull pitch propellers with Gullies
Bow Thrusters	1x Bow Thruster Inertia, 120 KW
Generators	1x 200 KW Main Generator 1x 50 KW Emergency Generator

LB2540

COURTESY ARIES R&D DIVISION



## LIFTBOATS: LB 4580



Design Specifications	
Water Depth	45 m
Total Decked Load	2000 T
Variable Deck Load	720 T
Air Gap	3.0 m
Log Dimension	3.0 m
Cable Protection	ARL, WGL, E-Blocker, WMS
Functions	Accommodation vessel Well intervention Hoisting, Work over
Design Environment	
Survival Conditions	
Water wave height	6.0 m
Corresponding wave period	8 sec
Max Wind Speed	100 knots
Max Current Speed	3 knots
Operational Conditions	
Water 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
Beam	25.0 m
Depth	4.0 m
Block area	450.00 m <sup>2</sup>
Legs	
No. of legs	4 nos
Type	Cylindrical
Leg length	80.0 m
Spread out type	Rectangular
Jacking System	
Jacking System	Back and Pivotal type
Cranes	
Main Crane	Hydraulic Type DWS, 45 T, 40 m radius Protection Type DWS, 5.5 T, 60 m radius
Accommodation	
Total Accommodation	120 persons
	3 Main cabins - 18 nos
	3 Main cabins - 18 nos
	4 Main cabins - 18 nos
Other facilities	3 no. Hospital (BON) Recreation Room Mess Room, Cuddy Change Rooms Laundry
Propulsion & Powering	
Turned Speed	8 knots
Propulsion	2 x Auxiliary Thrusters 1 x Main Engine, 400 KW
Bow Thrusters	1 x Bow Thruster Inertia, 400 KW
Generators	1x 1200 KW Main Generator 1x 250 KW Emergency Generator
Hull	
Length	45.0 m
Beam	25.0 m
Depth	4.0 m
Block area	450.00 m <sup>2</sup>
Legs	
No. of legs	4 nos
Type	Cylindrical
Leg length	80.0 m
Spread out type	Rectangular

LB4580

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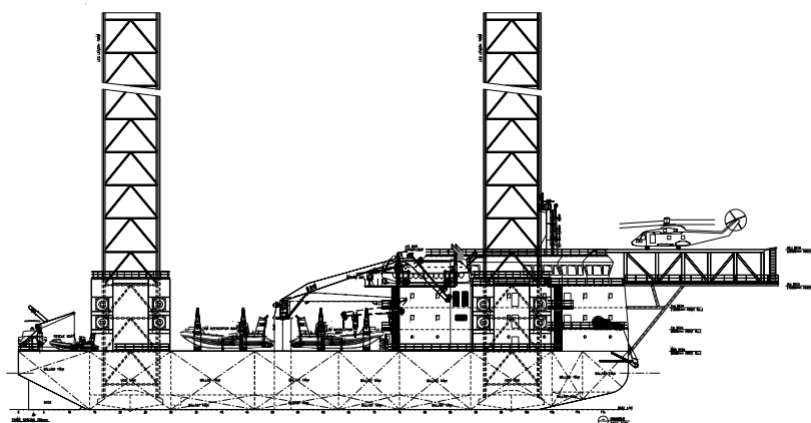




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## LIFTBOATS: LBD100



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## 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 ≥ 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 <sup>st</sup> 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

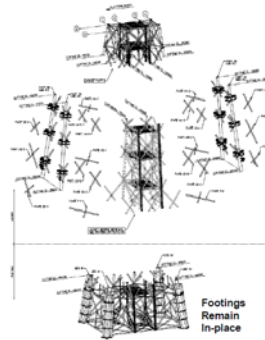
- MATURING OIL FIELDS IN SHALLOW WATER



**GULF OF MEXICO:**

- 
- The diagram illustrates a modular drilling rig with the following components labeled:
- Blud & Drilling Utilities Module
  - Rotational Forces for Gas Compressor Turbines
  - Frame Beam
  - Drilling Machine & Sub-structure
  - Production Crane
  - Hoist
  - Back Storage Unit
  - Accumulation Bin
  - Production Module
  - Power Generation Module
  - Utilities Module
  - Welding Module
  - Isolation System for Main Generator Turbines
  - Isolation System
  - Production Module

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



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

Ref: Oil & Gas Journal, Rigzone.com, Oil & Gas UK



## LETS DISCUSS