

# LIFT BOATS: ROLE IN PROVIDING VERSATILE OFFSHORE SUPPORT SERVICES

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## 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



- 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

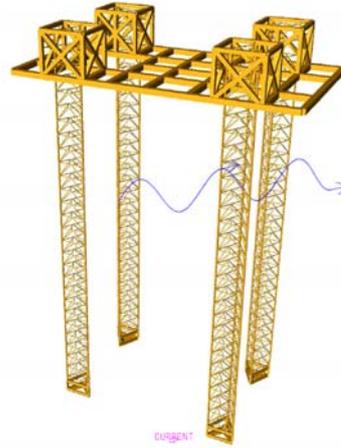




## LIFTBOATS: DESIGN CONSIDERATIONS

### DESIGN ANALYSES

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



URGENT



## 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	Max. Water Depth : 45 m	Max. Water Depth : 85 m
Length : 30 m	Length : 45 m	Length : 62 m
Breadth : 19 m	Breadth : 25 m	Breadth : 40 m
Depth : 3.5 m	Depth : 4.5 m	Depth : 6.0 m
Lap Length : 40 m	Lap Length : 80 m	Lap Length : 130 m
Deck Area : 200 m <sup>2</sup>	Deck Area : 450 m <sup>2</sup>	Deck Area : 1500 m <sup>2</sup>
Accommodation : 62 Persons	Accommodation : 100 Persons	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 Decked Load: 800 T	
Variable Deck Load: 100 T	
Air Gap: 1.8 m	
Leg Extension: 2.0 m	
Clear Height: 40.0 m (131 ft)	
Accommodation: 62 persons	
Well: 1.0 m	
Well Area: 220.0 sq m	
Legs: 4 nos	
Leg Type: Cylindrical	
Leg Length: 40.0 m	
Spread Leg Type: Rectangular	

LB2540

COURTESY ARIES R&D DIVISION



## LIFTBOATS: LB 4580



Design Specifications	Jacking System
Water Depth: 45 m	Jacking System: Rack and Pinion type
Total Decked Load: 2000 T	
Variable Deck Load: 700 T	
Air Gap: 3.0 m	
Leg Extension: 3.0 m	
Clear Height: 40.0 m (131 ft)	
Accommodation: 120 persons	
Well: 1.0 m	
Well Area: 400.0 sq m	
Legs: 4 nos	
Leg Type: Cylindrical	
Leg Length: 40.0 m	
Spread Leg Type: Rectangular	

LB4580

COURTESY ARIES R&D DIVISION



## LIFTBOATS: LB 8512

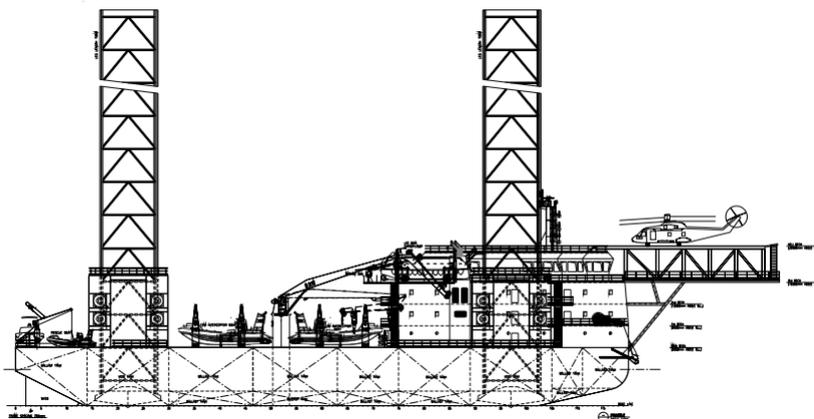


Design Specifications	Lifting System
Water Depth: 65 m	Lifting System: Rack and Pinion type
WOB (Nominal Load): 5500 T	
Variable Deck Load: 5500 T	Lifters
Air Gate: 70.8 m	Lift Enclosure: 50x 27.5 x 42.2m (incl. Potential Spine)
Lift Penetration: 8.0 m	Max Crane: 50x 50.7 @ 3000 tonnes
Deck Height: 41.4 m A1, Self-Centering	
Functions: LVL, A&S, CPC, Accommodation, Water, Fuel, Freshwater, Potable, W/O Zone	Accommodation
	Total Accommodation: 220 persons
	1 Main Cabin, 42 misc.
	2 Main Cabins, 42 misc.
	8 Main Cabins, 20 misc.
	1 No. Hospital (M&S)
	Office Room, Reception Room, Mess Room, Galley, Charge Room, Laundry
	Protection & Powering
	Ballast System: 4 cranes
	Production: 2x Kvaerner Transports, 1 Crane (Lifter, 800 KVA)
	Slow Transports: 1x Forewell Transport, 1x Forewell Transport, 1x Forewell Transport, 1x Forewell Transport
	Capacity: 1x 5000 KVA Main Generator, 1x 1000 KVA Emergency Generator
	Deck
No. of legs: 4 from	Deck: 4x 6.5 x 6.5
Type: Tube Construction	Deck Area: 222 sqm
Deck Height: 60.0 m	Maximum Take off Mass: 12.5 t
Deck Area: 1400.00 sqm	Design Standard: UK CAS (CA31)

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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



## LIFTBOATS: INTERNATIONAL MARKET

### DECOMMISSIONING WORLD-WIDE

#### GULF OF MEXICO:

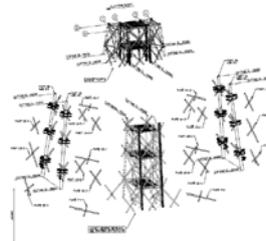
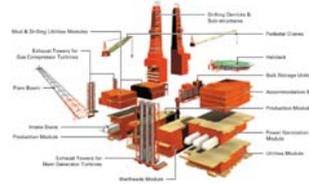
- CURRENT TREND SHOWS YEARLY REMOVAL OF APPROX. 150-200 PLATFORMS
- DECOMMISSIONING MARKET VALUED \$30-\$40 BILLION

#### 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



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



LETS DISCUSS