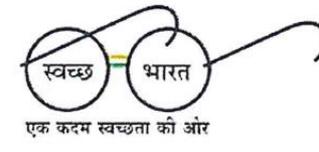


India's  
**energy**  
anchor



**ROADSHOW**



**Drilling & Work  
over Rigs**



**Houston  
25<sup>th</sup> April, 2016**



India's only Energy Company in *Fortune's* 'World's Most Admired' List

India: A business destination

ONGC: Corporate profile

**Drilling Services (Onshore) : An Overview**

New Rig Procurement: Roadmap

New Rig: Desired salient features

Major Drilling Rig Equipment

**ONGC Well Services (Onshore) : An Overview**

New Rig Procurement: Roadmap

New Rig: Desired salient features

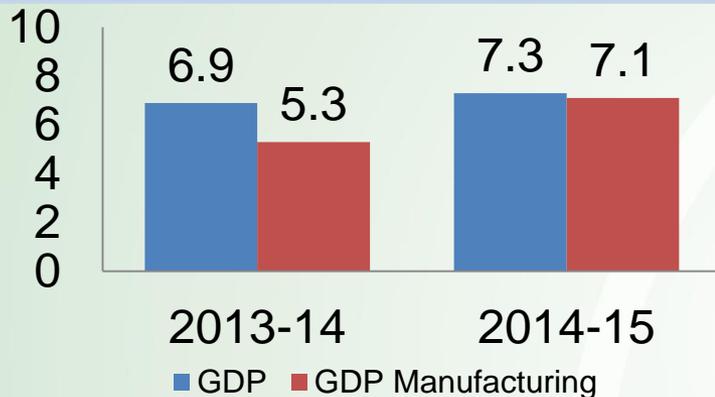
Major Workover Rig Equipment

India's  
**energy**  
anchor



# India: A Business Destination

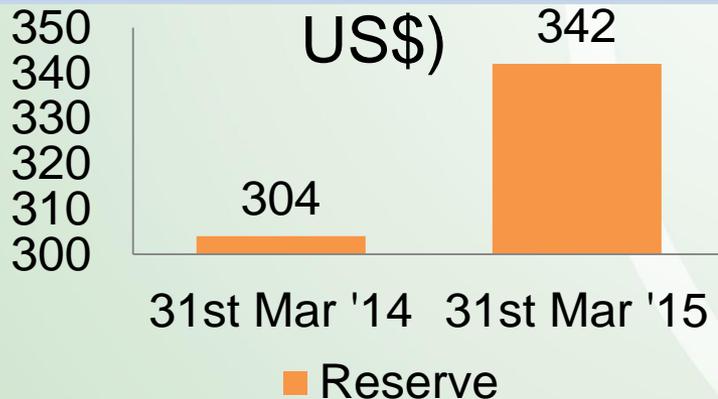
## Growth of GDP



## FDI Inflow (Million US\$)



## Forex Reserve (Billion US\$)



## IIP Growth Rate



Morgan Stanley

**Fastest large economy with 9-10% growth over the next 20-25 years**

McKinsey&Company

**India's economy will grow five fold in the next 20 years**



**India is expected to grow at 6.3 per cent in 2015, and 6.5 per cent in 2016**

O&G industry ranks among India's six core industries

47 Trillion cubic feet of proven natural gas reserves

96 Trillion cubic feet of recoverable shale gas resources

48% of sedimentary areas to be explored

740 MMT of proven oil reserves

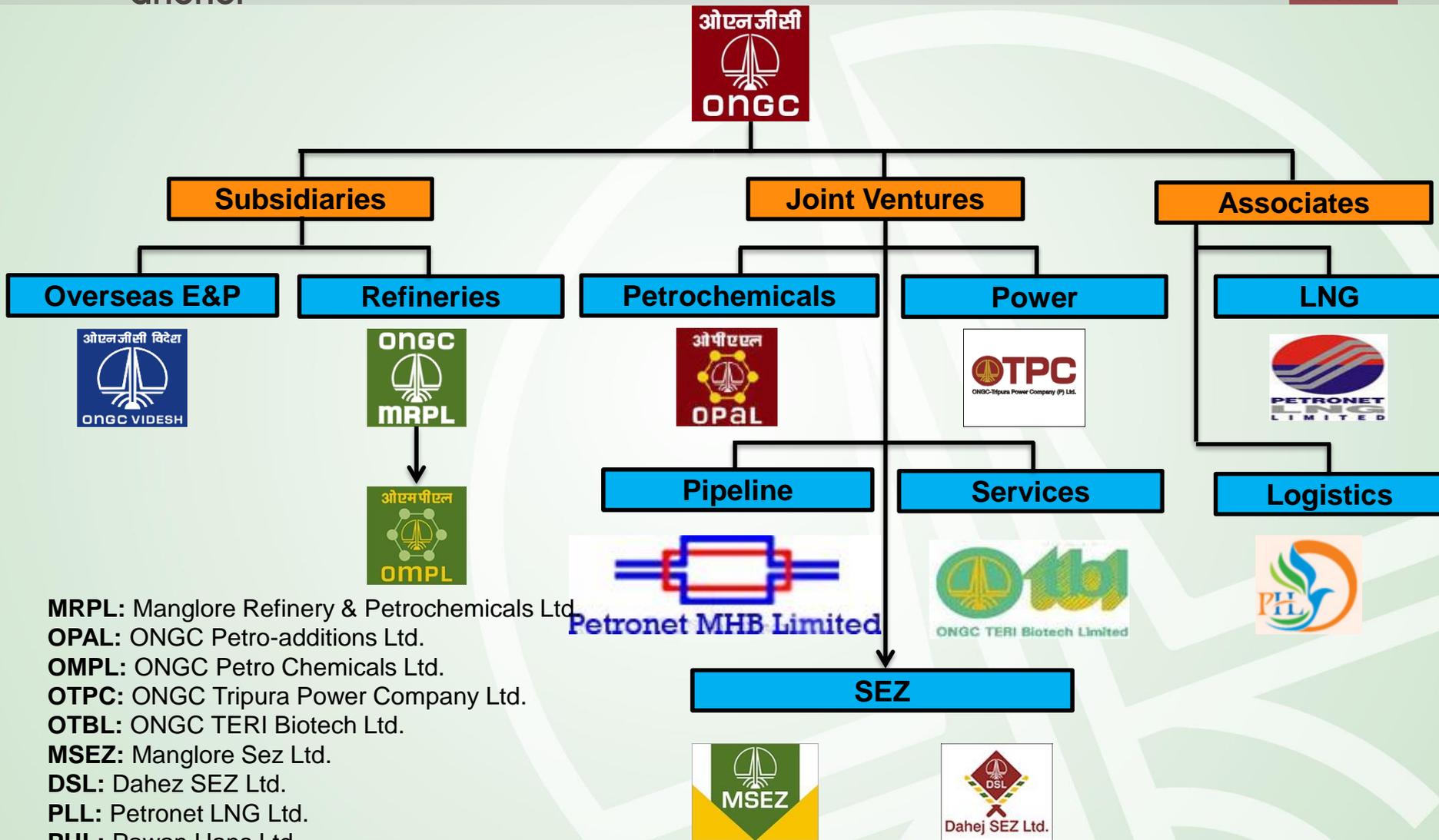
Presence of Drilling Contractors like BP, Cairn, Shell, BG, Niko

Expected 70 billion US\$ investment in O&G Sector (2012-17)

India's  
**energy**  
anchor



# ONGC: Corporate Profile



MRPL: Manglore Refinery & Petrochemicals Ltd.

OPAL: ONGC Petro-additions Ltd.

OMPL: ONGC Petro Chemicals Ltd.

OTPC: ONGC Tripura Power Company Ltd.

OTBL: ONGC TERI Biotech Ltd.

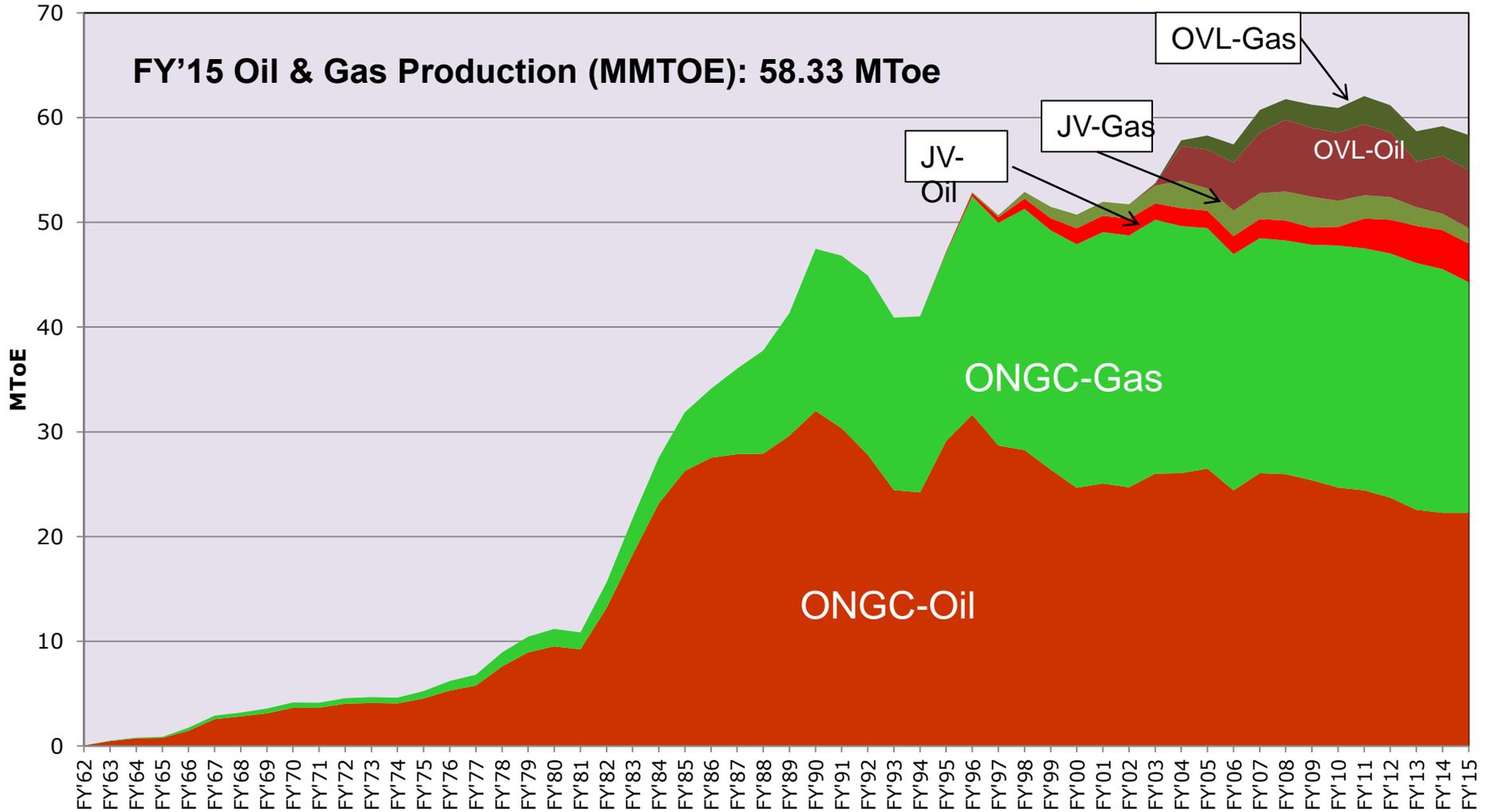
MSEZ: Manglore Sez Ltd.

DSL: Dahez SEZ Ltd.

PLL: Petronet LNG Ltd.

PHL: Pawan Hans Ltd.

# 50+ years of Contribution



# 50+ years of Value Creation

ONGC discovered **6 out of 7** producing basins in India

**83% of established reserves** (out of 10.9 BT) in the country has been discovered by ONGC.

**Largest exploration acreage and mining lease holder** in India (PEL: 49% & ML: 81%)

Annual turnover of US \$13.5 bn and a Net Profit of US \$2.9 bn.

ONGC Videsh footprints are spread across 36 projects in 17 countries.

# Resources

Well Stimulation  
Units: 121 (Land)

Drilling Rigs -  
Land  
66+5\*

Drilling Rigs -  
Offshore  
8+26\*

Work-over Rigs  
58+26\*

Well Stimulation  
Units: 8  
(Offshore)  
Vessels : 1+1\*

\* Charter Hired



# ONGC Videsh: Overseas Efforts

36 projects in  
17 countries

Producing: 13

Discovered/  
Develop: 4

Exploration:  
17

Pipeline: 2

- Overseas investment US\$ 23.81 Billion till FY'15
- 3P Reserves of 648 MMTOE
- FY'15: Oil & Gas production 8.87 MMTOE (182260 boe/day)

CIS		
Azerbaijan	1	1
Russia	2	2
Kazakhstan	1	1

South East Asia		
Vietnam	1	1
Myanmar	2	2
Bangladesh	2	2

Latin America		
Venezuela	1	1
Colombia	7	1
Brazil	1	1

Africa		
Libya	1	1
Sudan	1	1
South Sudan	2	2
Mozambique	1	1

Middle East		
Syria	1	1
Iraq	1	1
Iran	1	1

Asia-Pacific		
N. Zealand	1	1

# ONGC: Global Recognition

**3<sup>rd</sup>**

Among Global E&P Companies and 17th among Global energy majors (Platts 250)

**7<sup>th</sup>**

Worldwide in Fortune's Most Admired List 2014 under 'Mining, Crude Oil Production'

**18<sup>th</sup>**

Among global Oil and Gas Operations industry in Forbes Global 2000

**26<sup>th</sup>**

'Transparency in Corporate Reporting' by Transparency International

**217<sup>th</sup>**

in the Newsweek Green Rankings World's Greenest Companies 2014

# Drilling Service - An Overview

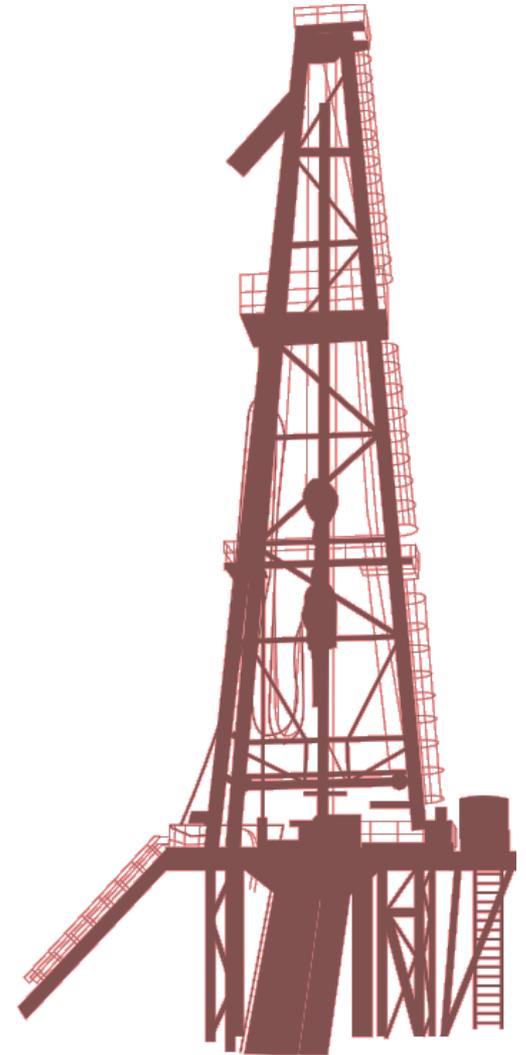
# Drilling: Onshore Assets & Basins



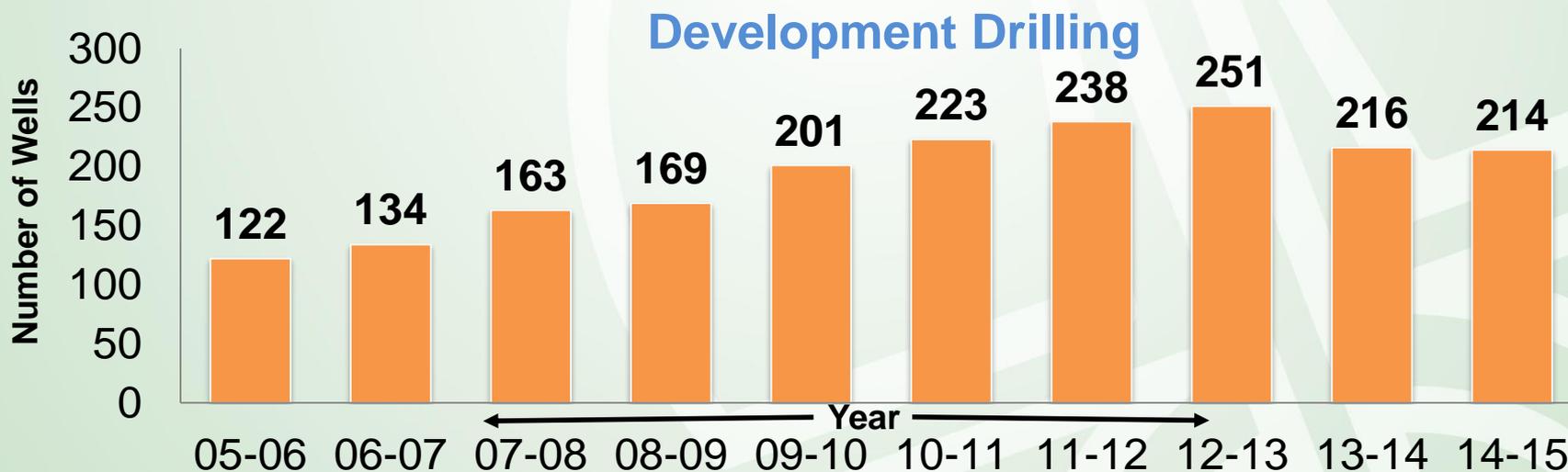
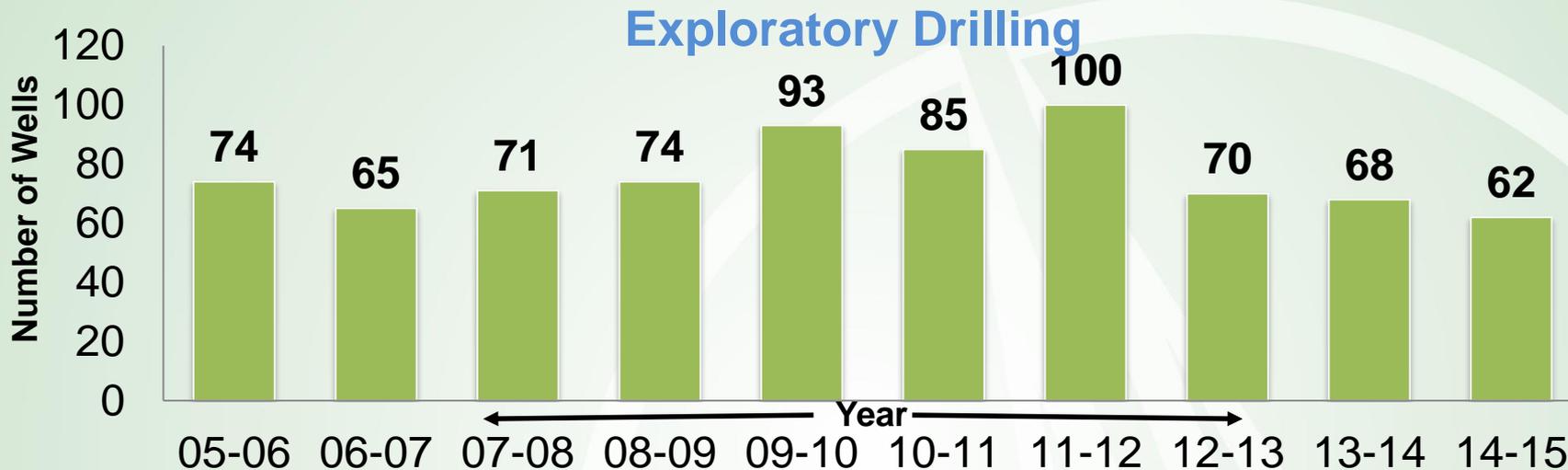
# RIG RESOURCES

Onshore: 66 (Own Rigs) & 5 (CH Rigs)

Type	Rig Resource
Mobile Rig	14 + 4 (CH)
Type-1 Rig	16
Type-2 Rig	18
Type-3	17+ 1 (CH)
Type-4	1
Total	66 (Own) + 5 (CH Rigs)

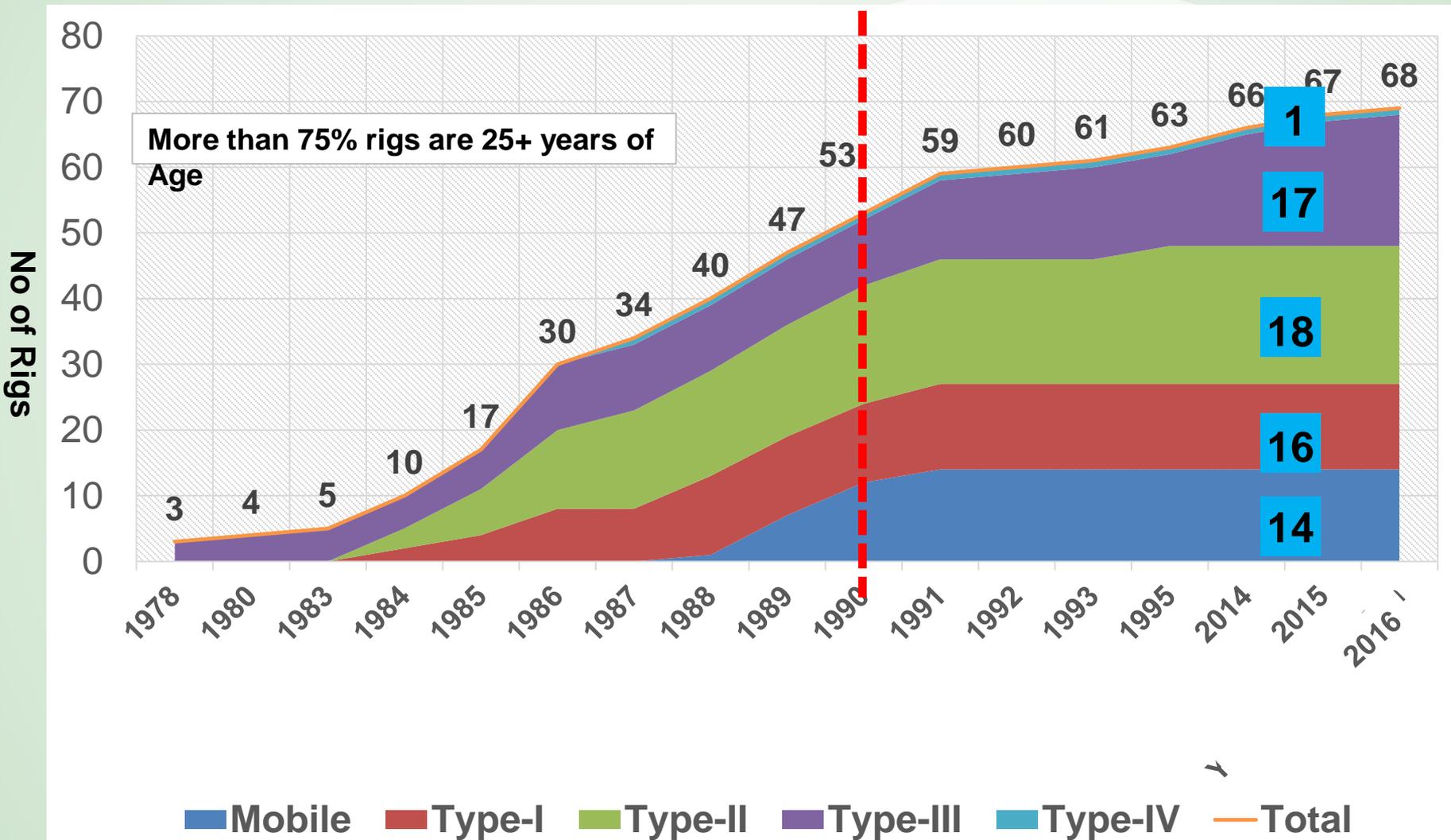


# Drilling: Statistics (2005-2015)



17<sup>th</sup> Energy Company in the World

# Drilling Rigs: Number & Age



SOBM

Non Damaging Fluid

Multilateral & Hz Wells

Casing drive system

Rotary Steerable System

Expandable Casing

LWD Tool

Conductor slot recovery

HGS mud system

Under balance drilling



## **New Drilling Rigs Procurement: Roadmap**

## Type of Rigs Under Consideration

### Rigs for Drilling Operation

1500 HP: Trailer & Conventional – 19 Nos.

2000 HP: Conventional – 8 Nos.

### Rigs for Workover Operation

50MT, 100MT & 150MT: Trailer Mounted

50MT-12, 100MT-05 & 150MT-03 Nos.

Induction of New Technologies

Safety of Man & Machines

Small footprint & Faster Transportation

Inter-changeability & Standardization of Equipment

Lesser manpower requirement

Safer & efficient drilling / Workover operations

India's  
**energy**  
anchor



## New Drilling Rig: Preferred Features

AC VFD Drilling Rigs

TDS, Iron Roughneck, Automated pipe racker

Hydraulic Catwalk, Hydraulic BOP Handling System

Independent hydraulic mast and sub structure raising system

Drilling CS : Integration of drilling & well control equipment

Real time monitoring: Critical parameters of major equipment

Data acquisition system: Compatible with SCADA

Higher rated mud system for enhanced discharge

Mud System: 7500 psi working pressure

Well control equipment: BOP, Control Unit, C&K Manifold

OEM Dual fuel kit for Power packs

Compressors & Centrifuge - VFD

Rig walking system (Provision)

Festoon cable system & Grasshopper cable tray

Rig transportation time: Lesser loads, Faster transportation

Footprint: Small footprint

SOBM Compatible (Optional)

High Pressure & High Temperature Compatible (Optional)

Manufacturing Facility in India

24x7 service support setup in India

Spare parts warehouse in India

Rate Contract for Spares

Training modules – Familiarization, O&M, Troubleshoot

Service engineer support.

Software to evaluate mast load bearing capacity & structure integrity.

# Additional Requirement

Inter-changeability: Common make & model across supply.

All electrical equipment designed to run at 50Hz.

Engine emission must meet Indian Pollution Control Norms.

Electrical equipment with Mines Safety (DGMS,India) approval.

## Major Rig Equipment: A brief description

# Mast & Substructure



- API 4F Certified.
- Hydraulic System for Raising Mast and Substructure.
- Provision for transporting Travelling Block and TDS with mast pieces.
- Software to evaluate mast load bearing capacity and structural integrity.



- Single Speed, Direct Gear Driven AC VFD Draw Works.
- Regenerative braking: Main Brake
- Parking brake: Disc Brake



- Pressure Rating: 7500 PSI
- 2200HP Pumps for 2000HP Rigs
- 1600HP Pumps for 1500HP Rigs.
- Direct Gear Drive Mud Pumps.
- Hydraulic Quick release system for Fluid end components

# Top Drive System



- Top Drive System of Capacity 500 Ton for 2000HP and 1500HP Rigs
- Real Time monitoring of various parameters like torque, mud pressure etc.
- Interlocking of IBOP and Mud Pump Control.
- Travelling block and hook conforming to API 8C

# Vertical Pipe Handler



- Hydraulically and Remotely Operated Stand Transfer Unit.
- Able To handle Drill Pipes of Dia  $2\frac{3}{8}$ " to  $6\frac{5}{8}$ "
- Able to handle Drill Collars of Dia upto 10"
- Parking Arrangement in case of any breakdown

# Hydraulic Catwalk



- Integrated to Drilling Control System
- Pipe Sizes: 2 $\frac{7}{8}$ "-20"
- lifting arms on both side

# Iron Roughneck



- Able to Handle Tubular of Dia  $2\frac{7}{8}$ " to  $9\frac{1}{2}$ "
- Make up Torque: Min. 100,000 ft-lbs
- Break up Torque: Min. 120,000 ft-lbs

# Power pack Engine



- 1250HP @ 1000 RPM Engines – Caterpillar
- Brushless generator 1430 KVA, 600VAC, 50Hz, 3Ph, 0.7 PF. IP 23 protections.
- Installed with OEM Dual Fuel Kit to operated engines with Natural Gas
- Real Time Monitoring of Engine and Gas Parameters

# Driller's Chair



- Driller's chair with Wireless control.
- Also One Extra Driller's Chair (wired) for Asstt. Driller which can be used as driller's chair in case of emergency.
- Asstt. Driller Chair for controlling Vertical Pipe Racker, Iron Roughneck, Hydraulic Catwalk & BOP Control Unit

# Well Services - An Overview

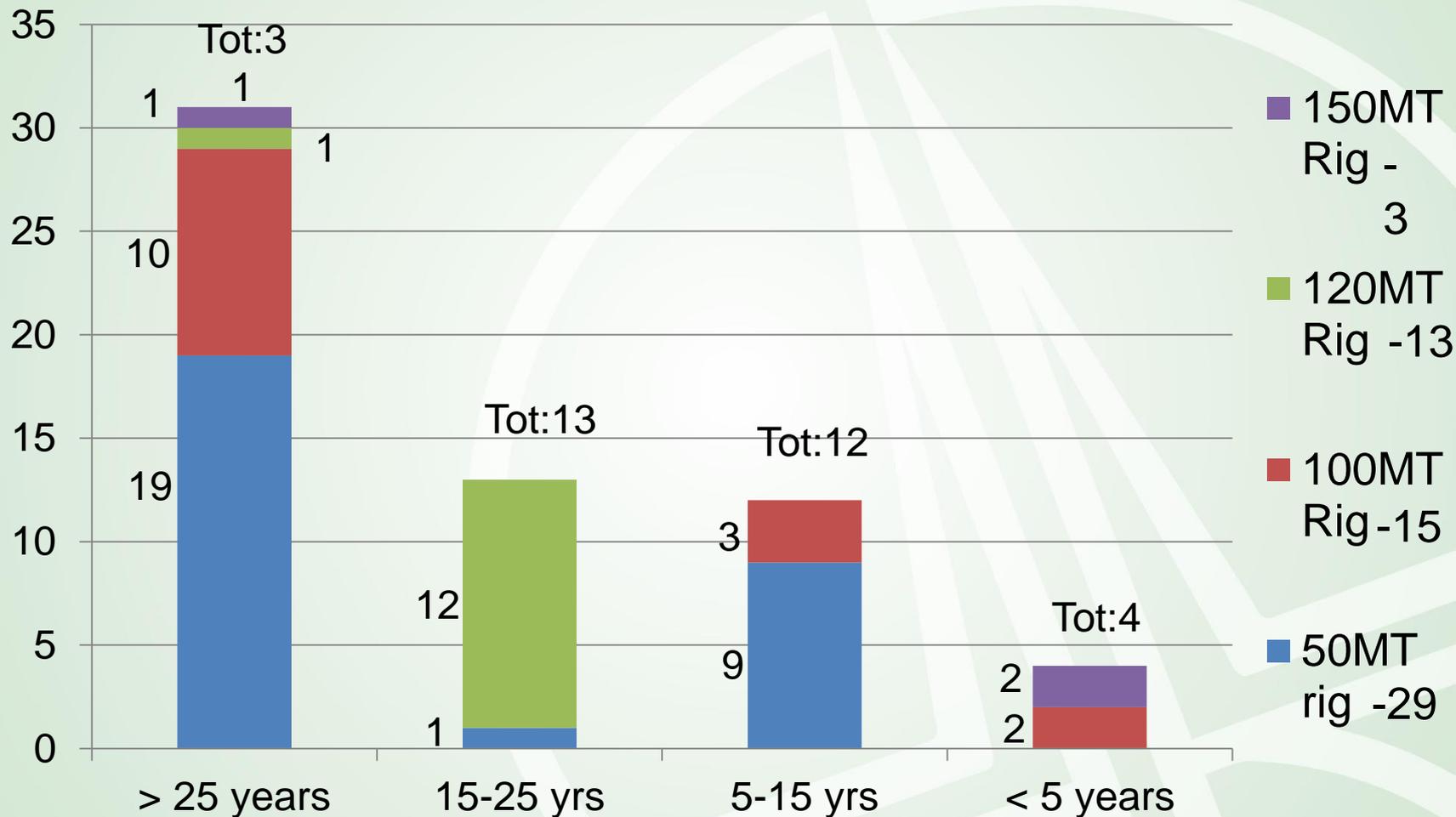
# Well Services: Onshore Asset & Basin



## Wells Worked over



# Workover Rigs: Number & Age



Automated Workover Rigs to handle Range II tubular

TDS, Automatic catwalk pipe handler Anchorless rigs

Crownomatic, Flooromatic, Mast Overloading protection

Rig operations with joystick with additional wired control

Driller cabin on substructure with joystick control

Hydraulic BOP Handling System

Suitable Automation for Sucker Rod Handling

Mud Pump, Mud tanks, Brine F/U, Trip tank, Generator

Well control equipment: BOP, Control Unit, C&K Manifold

Rig walking system (Desirable)

## Additional Requirement

Manufacturing Facility in India

24x7 service support setup in India

Spare parts warehouse in India

Supply of Spares to be ensured till life of rig

Training modules – Familiarization, O&M, Troubleshoot

Service engineer at each rig: 3 months from commissioning

Software to evaluate mast load bearing capacity & structure integrity.

# Additional Requirement

Inter-changeability: Common make & model across supply

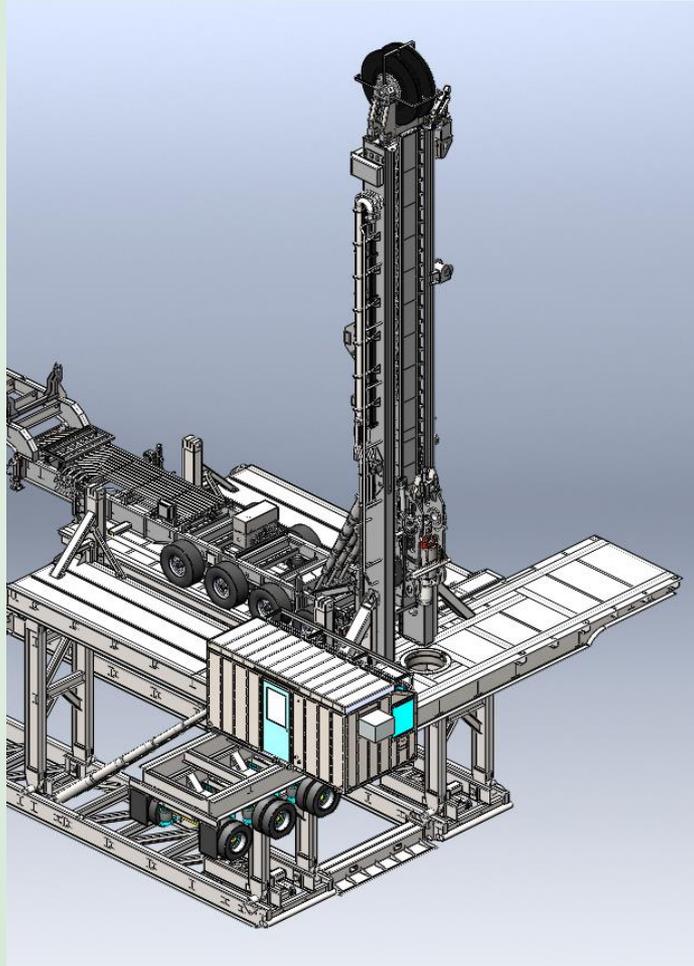
All electrical equipment designed to run at 50Hz

Rig Engine: ECM controlled, Tier 4 diesel engine

Rig Engine: Fitted with Dual Fuel Kit (Desirable)

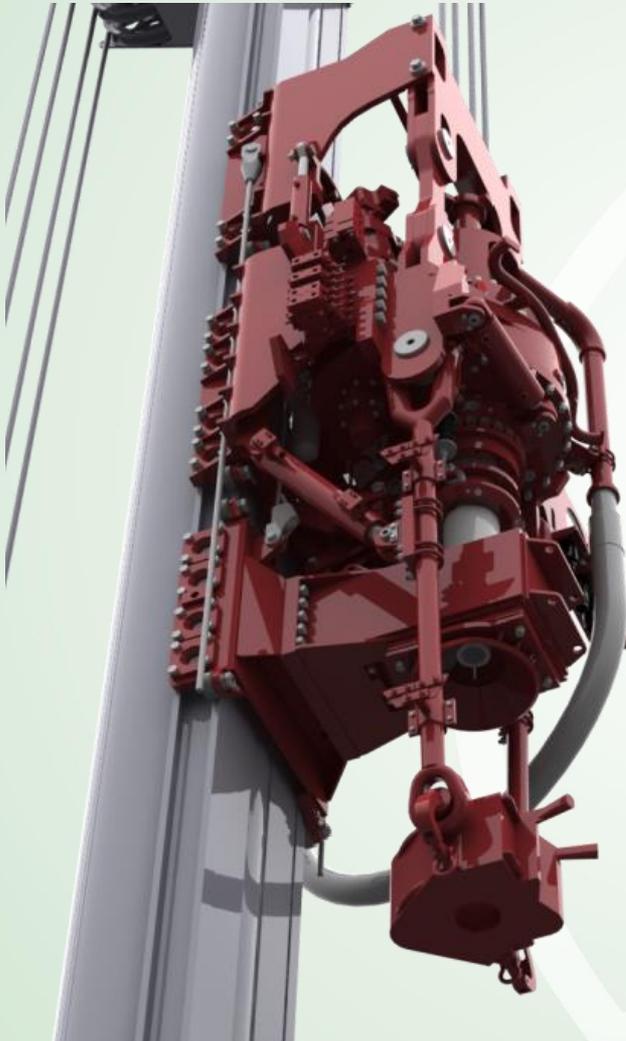
# Major Rig Equipment: A brief description

# Mast & Substructure



- Mast & Substructure should be API 4F Monogrammed.
- Hydraulic System for Raising Mast and Substructure.
- Substructure clear height below rotary minimum 14ft

# Top Drive System



- Top Drive System of as per Capacity of Rigs (50MT / 100MT /150MT)
- Real Time monitoring of various parameters like torque, mud pressure etc.
- Travelling block, hook, Elevator conforming to API 8C and suitable to work with drill pipe, tubing and sucker rods.

# Hydraulic Pipe Handler



- To handle Drill Pipes, tubings 2-3/8" to 3-1/2" and sucker rods size 5/8", 3/4", 7/8" to 1"
- To be remotely operated with additionally wired control also.
- Capacity to rack 2500 / 3500 / 4500 meter tubulars.

# Power Tong



- Able to Handle Tubulars of Dia 2-3/8" to 7-1/4"
- Torque: Min. 35,000 ft-lbs

# Driller's Chair



- Driller's chair with Wireless control for rig operations, controlling Pipe handler, Power tong, Hydraulic Catwalk & BOP Control Unit
- Also One Extra Driller's Chair (wired) for Asstt. Driller which can be used as driller's chair in case of emergency.



## **Question & Answer**

# THANK YOU