



INTRODUCTION OF BOMCO 6000HP RIG



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■ **Background of Ultra-deep Drilling Rigs:**

1. The strategic need for Exploration and Development of Ultra-deep Oil&Gas Reservoirs;
2. Technology Revolution in China Oil Industry;

■ **Achievement and Applications in Oilfield:**

BOMCO developed the first 12,000-meter drilling rig in Oct. 2007, which started the industrial test in 2008 and completed the well in July 2009 with the drilling depth 7560 meters. Up to now, this drilling rig has refreshed many records of the ultra-deep wells.

The second 12,000-meter drilling rig was fabricated in year 2009 with the same configuration as the first 12,000-meter rig, operated by Sinopec Huabei; now in the operation of 12th well with total drilling depth is above 90,000 meters.



- The 3rd and 4th 12,000-meter deep-well automated drilling rigs were delivered to end user on time in 2023.
- These two 12,000-meter drilling rigs are equipped with automated drilling equipment (Detailed introduction)
- A professional technical and service team has been established to fully support the operation of the 12,000-meter drilling rigs.
- On 4th Mar. 2024, the drilling depth of 3rd 12,000-meter drilling rig operating in CNPC deep geological exploration Well exceeded 10,000 meters.





BOMCO is the Pioneer of ultra-deep drilling rigs in China.

BOMCO 9,000-meter (3000HP) deep-well drilling rigs

- BOMCO has delivered 67 sets of 9000m drilling rigs to customers since year of 2006.
- 6 more sets of new 3000HP rigs are under construction & will be delivered in Q4 2024.

BOMCO 12,000-meter (6000HP) deep-well drilling rigs

- 1st 12000m drilling rig delivered in 2007;
- 2nd 12000m drilling rig delivered in 2009;
- 3rd 12000m automated drilling rig delivered in 2023;
- 4th 12000m automated drilling rig delivered in 2023;
- 5th 12000m automated drilling rig under production planned to deliver in Oct. 2024



Rig General Introduction

China-Made Gen-sets
and VFD Control System



3000HP High Pressure Mud Pump
Open and Close Auto control of
Ground High Pressure Manifold

15-Meter High Swing-
Substructure, 52-meter Mast
with 6000HP Drawworks

idriller® Touchscreen Dual Driller
Integrated Control System.

Automated Pipe Handling System of
10K Meter Grade with Automated
Handling of 11" Drill Collars

- Broken through the key technologies such as the high-load lifting system of the ultra-high rig floor and the automated pipe handling processing of 10K-meter Strings.

Power Transmission System

- Main Power adopts 7 sets Gen-sets, VFD Speed Control and Grid Power interface is reserved;

Lifting and Rotating System

- DW, RT and TD are driven by AC motor, Front Open K-type Mast with Swing up substructure, Driven by the DW power;

Automated Pipe Handling System

- Equipped with a full set of automated pipe handling system, can automatically process the pipes from the yard to the wellhead;

Mud Circulating System

- Four QDP-3000U Quintuplex-cylinder pump sets, Max. pressure up to 70MPa, and manifold ground gate valves are auto control(Open&Close).

Integrated Control System

- idriller® Touch Screen Dual Driller Integrated Control System of Pipe Handling Equipment, DW, RT, Mud Pump, Top Drive and etc.

Remote Monitor System

- Operation Monitoring on key drilling equipment with maintenance reminder, fault diagnosis and other functions.



The key technical parameters of the drilling rig are ahead of the land drilling rig in use, meeting the needs of exploration and development of 10,000 meters deep Wells.

Item	Description	Parameters
1	Drilling depth	12000 m
2	Max. Hood Load	9000 kN
3	Mast Effective Height	52 m
4	Rig Floor Height	15 m
5	Tubular Handling Range	2 7/8-24 (in)
6	Mud Pump Working Pressure	70MPa (10,000psi)





Key Equipment Introduction

I. Ultra-High Rig Floor and Ultra-large Set back Capacity Substructure

The **15-meter** ultra-high rig floor design and the wellhead clearance height of 13.5 meters meet the installation requirements of 175MPa(25000psi) ultra-high pressure complex Well Control Equipment, and improve the drilling rig's ability to carry out ultra-deep complex oil and gas exploration.

The **setback load is 5400kN, the racking capacity is 12000 meters**, and is Number one in China in the weight and length of the racking stands.

Item	Description	Parameters
1	Rig Floor Height	15 Meters
2	Clearance Height of RT Beam	13.5 Meters
3	Setback Load	5400kN
4	Setback Racking Capacity	12000 Meters (5 7/8, 6 5/8" DP)

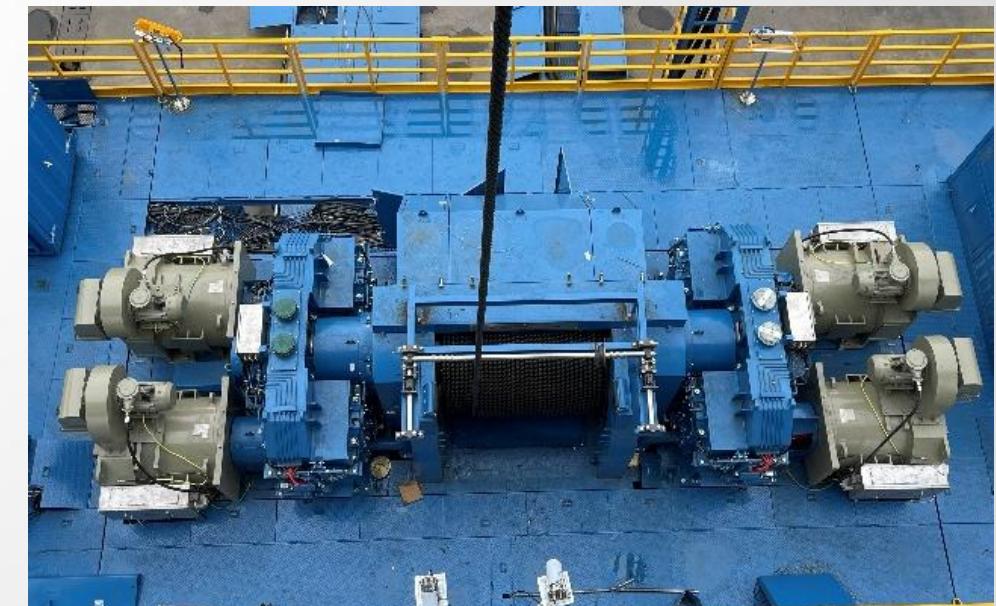


Key Equipment Introduction

II. 6000HP High Load Ratio Drawworks.

6000HP Drawworks, nearly 1000 tons of lifting capacity, with ideal output characteristics, Load to Weight ratio is large, the **highest hook speed above 2m/s**, tripping speed increased by 8%, can continuously lift the hook load to maximum 9000kN, better meet the needs of ultra-deep oil and gas drilling and lifting operations.

Item	Description	Parameters
1	Maximum Hook Speed	Above 2m/s
2	Lifting Capacity	9000kN
2	Weight	100T



Key Equipment Introduction

III. 3000HP Quintuplex Cylinder Mud Pump

The maximum pressure of the drilling pump is 70MPa (10000psi), which is more suitable for Jet Drilling requirements.

Characteristics: high pressure, large power, large displacement, small fluctuation of displacement and pressure, high reliability and high efficiency, and effectively improves the hydraulic rock breaking efficiency of deep Wells.

Item	Description	Parameters
1	Mud Pump Type	Quintuplex Mud Pump
2	Mud Pump Power	3000hp
3	Maximum Working Pressure	70MPa
4	Maximum Displacement of Single Pump	95.69(L/s)
5	Displacement Fluctuation Range	6.5% (W/O PD)





Key Equipment Introduction

IV. 9000KN AC Variable Frequency Top Drive Device

9000kN top drive, flush pipe to meet 70MPa pressure, continuous working torque 86kN•m, maximum unloading torque 135kN•m;

The working pressure is matched with the high pressure circulation system to improve the operating capacity of the system.

Item	Description	Parameters
1	Top Drive Working Pressure	70MPa
2	Internal Diameter	102mm

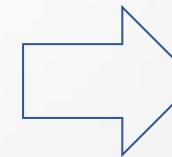


DQ120BSC Top Drive Device

Key Equipment Introduction

V. Ultra-Large Capacity of the Automated Pipe Handling System

Newly developed Automated Pipe Handling Device, equipped with **9 Automated Pipe-Handling Equipment** such as efficient **Power Catwalk**, **Rig Floor Manipulator**, **Monkey Board Manipulator**, and **Pipe Boom Lifting Equipment**, which can adapt to the operation in plain and mountainous areas, meet the pipe conveying to 15-meter high rig floor and the storage and transfer of more than 12,000-meter ultra-capacity drill strings, and realize the whole process of automated operation of drill string from yard to the well center, reducing the heavy manual labor by more than 80%.





Key Equipment Introduction

➤ Power Catwalk



Performance Features

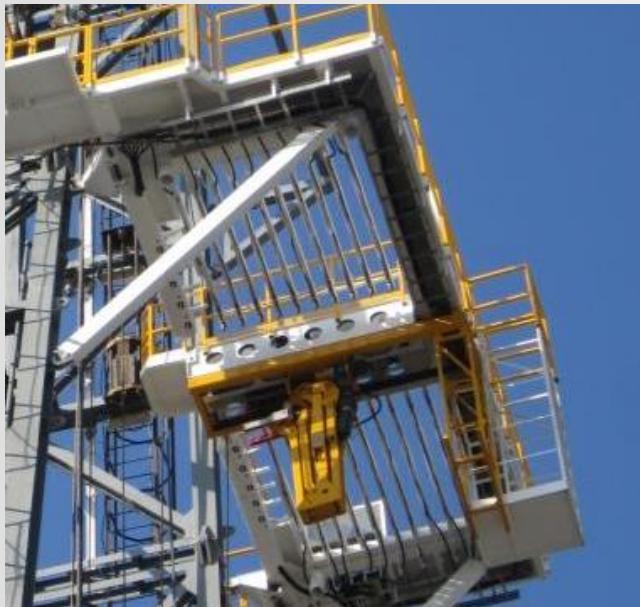
- Efficient conveying, can achieve Pipe "Four up and Four down" in one way;
- The whole equipment adopts electro-hydraulic compound drive scheme, and the main hoisting adopts double motor frequency conversion drive;
- The main lifting adopts the compacted strand wire rope and the double rope configuration to ensure the essential safety of the equipment

Suitable Rig Floor Height	Conveying Pipe Length	Maximum Weight of Conveying Pipe	Diameter Range of Suitable Pipes
15-15.6m	8.5-14.5m	45kN	2 7/8~24 in



Key Equipment Introduction

➤ Monkey Board Manipulator



Performance Features

- Rack the Stands by Pushing, One Key Control;
- Servo Motor Drive, High Control Precision, Low Noise;
- Integrated Design, Overall Low Installation, Small Mast Load;
- By Remote control, job safety and work environment are improved significantly.

Suitable Pipe Specs

2-7/8 " ~10"

Maximum Working Radius

3500 mm

Key Equipment Introduction

➤ Rig Floor Manipulator



Performance Features

- Servo Motor Drive, High Control Precision, One key Automatic Racking;
- Self-adaptive Flexible Floating Clamp Head Design, adapt to a large range of drilling Strings;
- It can move aside to avoid setback passages when not working;
- With Position Memory Function, the Average Racking time during Tripping is 20 seconds;
- By Remote control, the job safety and work environment have been improved significantly.

Suitable Drill String Range	Maximum Working Radius	Walking Distance	Offsetting Distance
2 7/8in ~ 11 in	3400 mm	2900 mm	1100 mm

Key Equipment Introduction

➤ Integrated Iron Roughneck



Performance Features

- Integrated auxiliary centering, thread oil spraying, mud blowout prevention function in one;
- One-click Automatic Control, Real-time Monitoring Torque, Automatic Selection of the Clamping Tool High and Low Pressure;
- It can meet the 11in drill collar and the maximum break-out torque is 160000N.m;
- Visual identification of joint position of drill pipe, improve the efficiency of making up and breaking out;
- Each action state is monitored and interlocked in real time, making the operation efficient, safe and reliable.

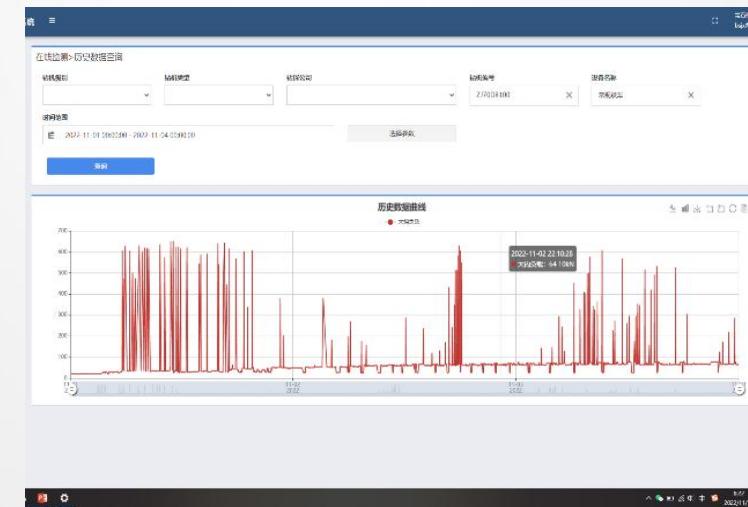
Breaking out Tong Range	Maximum Breaking Out Torque	Maximum Spinning Torque (5in)	Thread Oil Applying Range (Drill Pipe)
2 7/8in ~ 11in	160 000N.m	5500N.m	2 7/8in ~ 6 5/8in



Key Equipment Introduction

VI. Equipped with Remote Monitoring and Maintenance System

Real-time collection and remote transmission of the operation and status data of the key equipment such as diesel generator set, VFD electronic control system, MCC, Drawworks, Drilling Mud Pump, Automated Pipe Handling equipment and etc., through the visual interface for equipment operators, maintenance personnel, management personnel to provide real-time monitoring, historical data query, rig file management services.





Key Equipment Introduction

VII. Automated Solid Control System

Performance Features



- Visual display and control in the whole operation process, centralized control and monitoring of integrated sitting room, remote transmission and exchange of data and other functions, to achieve intelligent interaction;
- High-performance "Secondary Purification", cuttings reduction, reduce drilling fluid consumption, to achieve the recycling of Barite;
- Overall quick disassembly, Quick pipeline connection, Modular structure design;

Key Equipment Introduction--Automatic Solid Control System

➤ Negative Pressure Shale Shaker



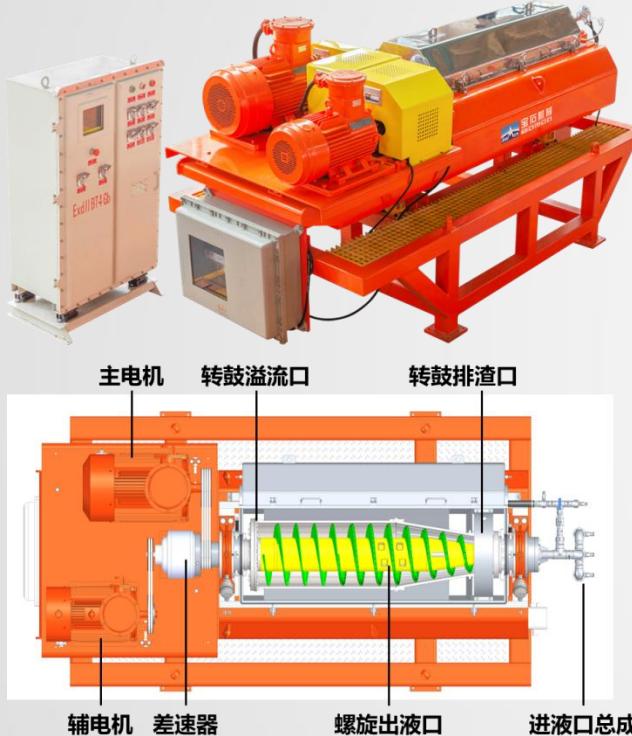
Performance Features

- The processing capacity is large, and the processing capacity of the negative pressure state is more than 20% higher than that of the normal pressure state;
- Reduce the liquid content of treated drilling waste by more than 10% compared with conventional screening;
- The wearing parts are common and interchangeable to the conventional shale shakers and easy to maintain;
- Adopting mechanical pulsation regulation system, the system is stable;
- The sealed drain valve drains the liquid in real time, prevents blockage, does not accumulate sand, does not need to wash sand.

Model	Maximum Amplitude	Max. Handling Volume	Liquid Content of the Oil Base Waste Volume	Liquid Content of the Water Base Waste Volume
GX/F 270	6.5mm	65L/s	≤30%	≤30%
GX/F 340	6.5mm	70L/s	≤30%	≤50%

Key Equipment Introduction--Automatic Solid Control System

➤ High Speed Centrifuge.



Performance Features

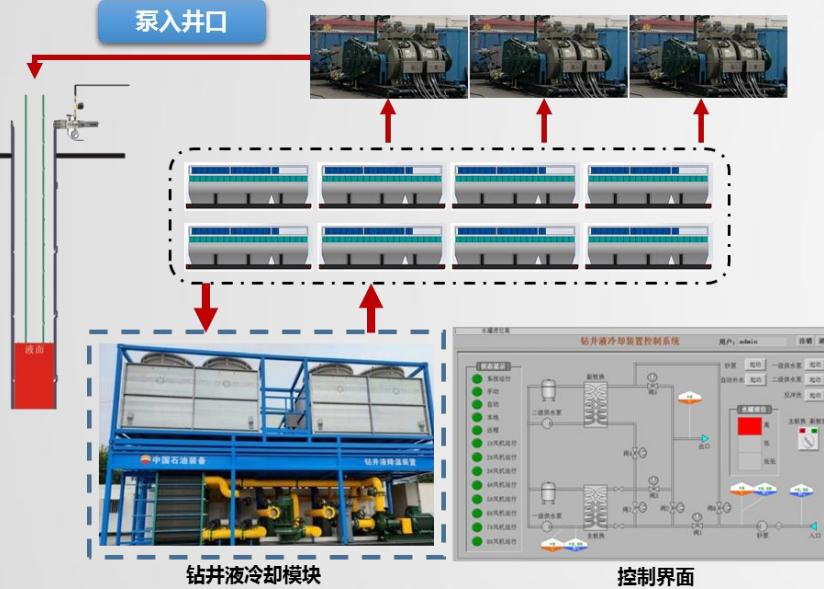
- The main body adopts 2205 duplex stainless steel to avoid drum deformation caused by high speed; Centrifugal casting;
- The dynamic balance accuracy reaches G2.5, and the equipment runs smoothly at high speed;
- Real-time monitoring of vibration intensity, bearing temperature, motor current, etc., automatic adjustment of speed and liquid intake.

Rotating Drum Size	Maximum Speed	Water Handling Capacity	Drilling Fluid Capacity
Φ380×1400mm	4000r/min	15 ~ 25m ³ /h	3 ~ 5m ³ /h



Key Equipment Introduction

➤ Drilling Fluid Cooling System



Performance Features

- Adopt plate heat exchanger+counter-current water tower system, high heat transfer efficiency;
- The circulation and filtration system is used and standby for high reliability;
- The heat exchanger adopts a variety of cooling modes in series and parallel, which has strong flexibility;
- Modular Design, Small Footprint;
- With one key to keep constant temperature and automatic backwash, high degree of automation.

Rated Drilling Fluid Displacement	Rated Drilling Fluid Density	Cooling Range	Sand Pump Displacement	Total Power of the Installed System
2.5m ³ /min	2g/cm ³	35°C~70°C	280m ³ /h	187.95kW

Key Equipment Introduction

VIII. Drilling Bits



Performance Features

- The Roller Bit adopts high quality carbide teeth, which is welded with a new type of wear-resistant alloy, based on Smith roller bit technology, have high reliability in high-speed drilling;
- Diamond Bit using PDC composite sheet or natural diamond as cutting element, diamond bit optimized tooth layout design, improve the adaptability to earth formation and rock breaking efficiency;
- The Combined Drill Bit mainly uses PDC scraping and rock breaking, and the roller as supplemented to break the rock. The drill bit has strong aggression and takes into account the rock breaking ability and stability.

Product Type	Sizes
Roller Bit	3½ ~ 36 in
Diamond Bit	6 ~ 17½ in
PDC-Roller Combined Bit	57/8~22 in



Key Equipment Introduction

X. Mixed Energy Storage System



Performance Features

- Can be used with various types of generator sets, including CAT, Jichai 175 series, etc
- Diesel saving up to 20% during tripping and the average diesel saving of the whole well is 10%;
- The frequency fluctuation is reduced by 53.8% and the voltage fluctuation is reduced by 45%;
- Reduce carbon emissions by 10%, NOx, CO emissions by 20% annually;
- Reduce the configuration capacity of the generator set, reduce the dependence on the dedicated unit, and extend the maintenance period;

Product Type	Rated Power(KW)	Responding Time	System Efficiency	Cooling Type
Mixed Energy Storage	1200/1500/1800	10ms	92%	Wind Cooling



BOMCO 12,000-meter (6000HP) Drilling Rig

BOMCO

Applications:

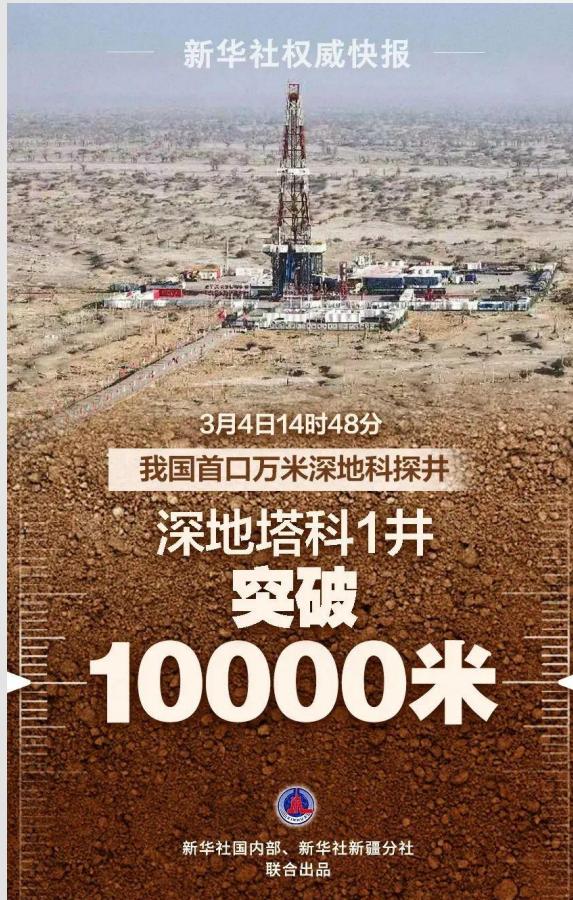
The above introduced 12000-meter drilling rig has been successfully applied 2 sets (3rd and 4th rigs), and the operation of each rig equipment is reliable.

BOMCO has the **mass production capacity** of this type rig, mastered **the whole industrial chain of the rig integration**, and can carry out mass production according to the needs of exploration and development of 10,000 meters deep Wells.

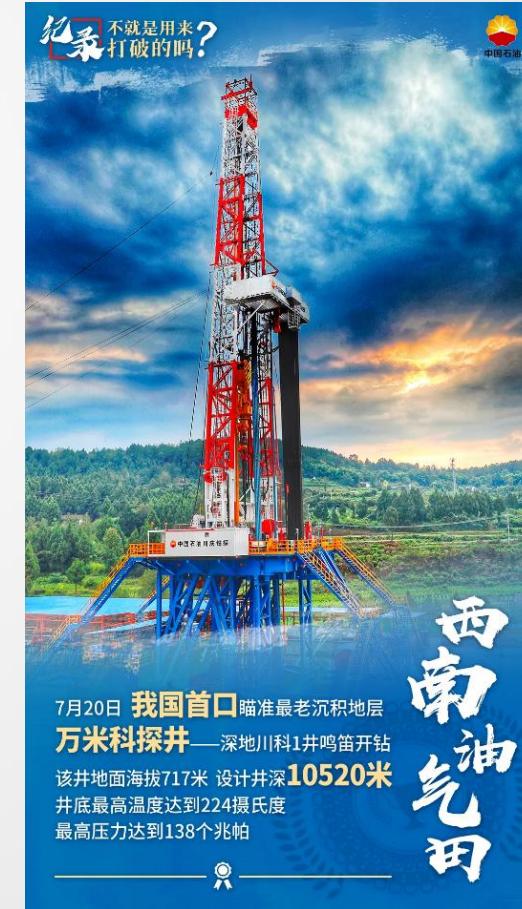


Applications:

The 3rd 12000-meter drilling rig has successfully created the record of the deepest casing and the heaviest casing of the same size in China.



The 4th 12000-meter drilling rig started operation on 20th July 2024 and has set a new national record for the highest penetration rate in a single run of 593.7mm (23.4") hole.





EDAME

THANK YOU!



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