

BASIC CONDITIONS AND CHALLENGES OF ROBOTIC AUTOMATION IN ON-LAND AND OFFSHORE DRILLING

////// BITROBOTICS

The first in Russia developer and producer of high-speed industrial robots.



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- Resident of SEZ Technopolis «Moscow»
- High-tech production of complete cycle robotic systems
- Since 2019 Bitrobotics has been developing robotic systems for drilling round-trip operations in gas and oil industry in co-operation with leading companies in the field of drilling

////// BASIC CONDITIONS FOR ROBOTIC AUTOMATION

2021

2030



hazardous working environment

Existing robotic solutions can replace hundred thousands of work positions in order to eliminate manual labor in hazardous areas.



time optimization

Implementation of robotic solutions will decrease production hours in terms of increase of complexity and depth of boreholes.



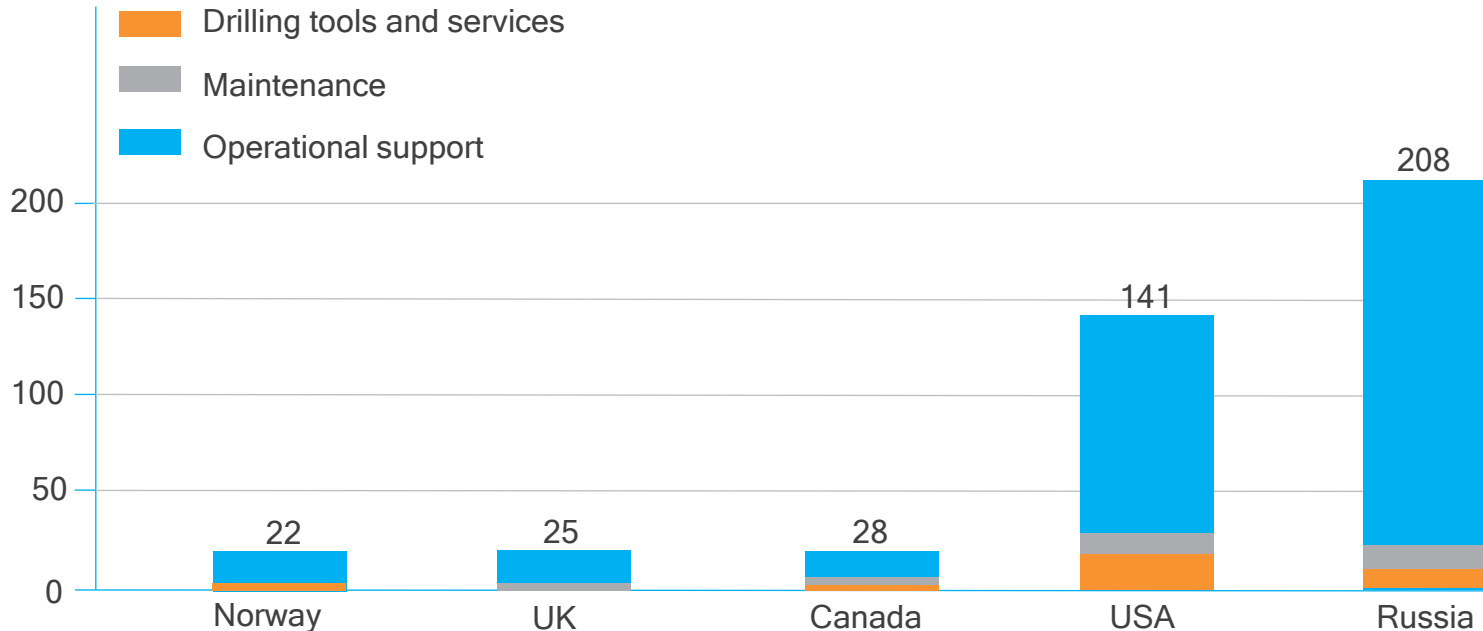
procedure autonomization

Relevancy of robotic solutions is directly related to the demand of autonomization in the process of Arctic shelf reclamation.

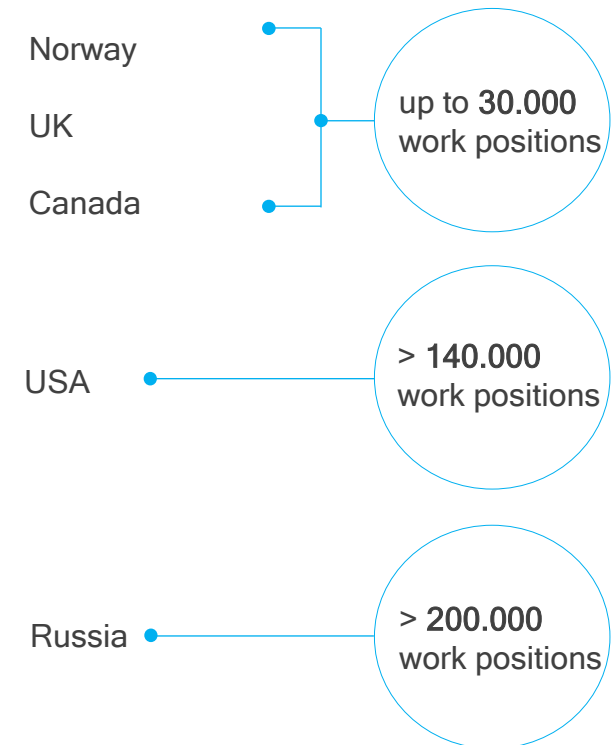


////// POTENTIAL REDUCTION OF MANUAL LABOR

• Number of employees in thousands



• Decrease of personnel demand in case of robotic automation in the following 10 years:



////// BASIC APPROACHES TO ROBOTIC AUTOMATION

01

Implementation of automatic drill rigs



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02

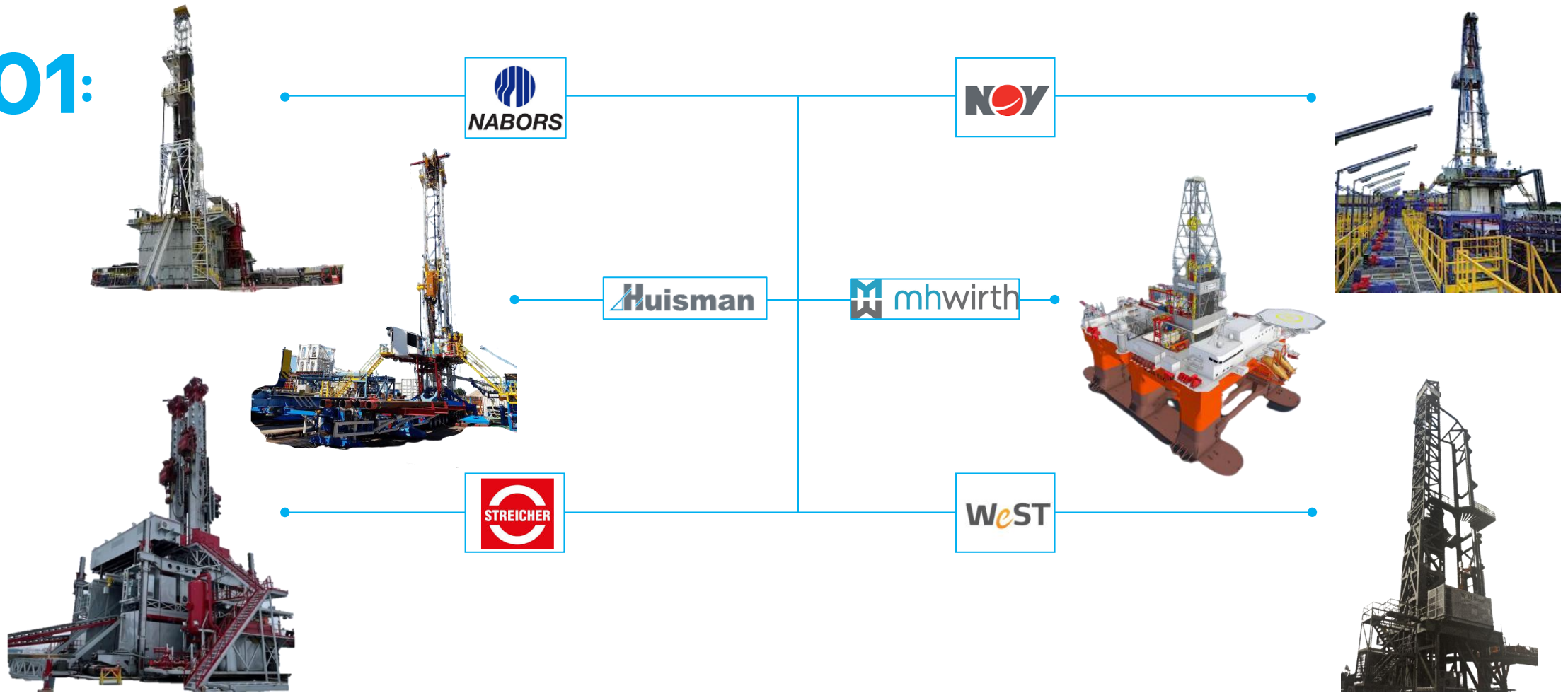
Robotic automation of existing drill rigs





BASIC APPROACHES TO ROBOTIC AUTOMATION

01:



////// BASIC APPROACHES TO ROBOTIC AUTOMATION

02:



Robotic system for round-trip operations

• 2021-2024

Unified Control System(ECS)of basic production equipment at a drill rig

• 2022-2025

Automatic multi-size drilling tongs for operation of drill and case pipes

• 2023-2027

Automatic system for production and conditioning of mud fluid

• 2023-2027

////// ROBOTIC SYSTEM FOR ROUND-TRIP OPERATIONS

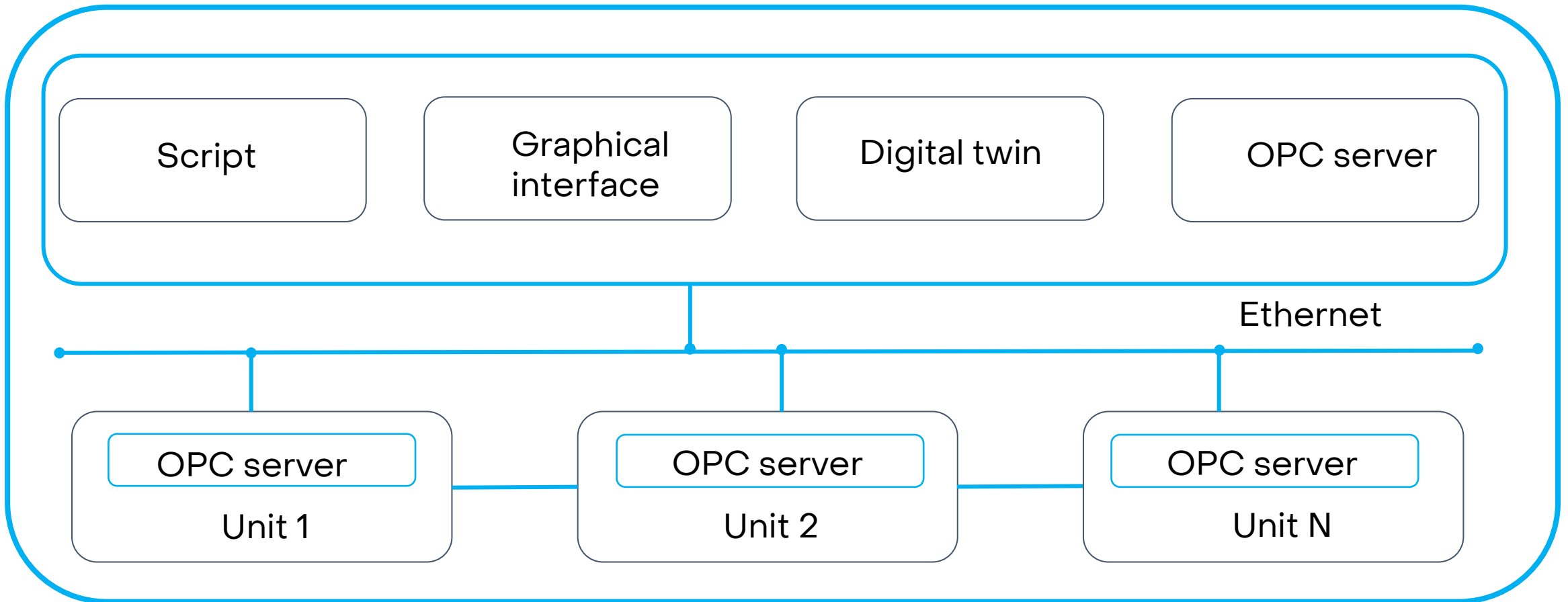
Specifications

- 3-4 five-axis industrial robots
- Electric drive
- Weather conditions from -45 C° to $+55\text{ C}^{\circ}$
- Modular design
- No personnel at operations with drill pipes
- Speeding up of round-trip operations due to accuracy and frequency
- Embedded system of interference protection



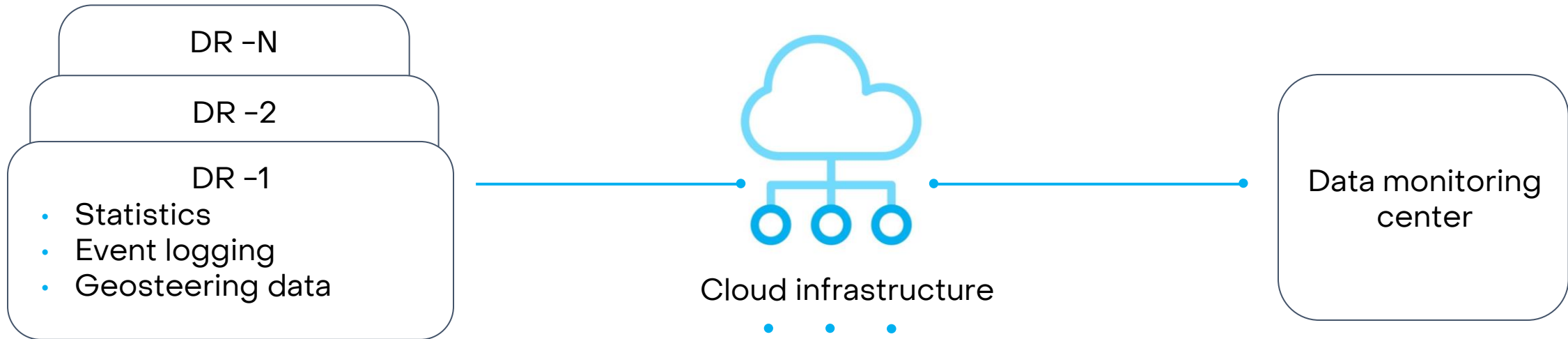
UNIFIED CONTROL SYSTEM

Platform architecture



////// UNIFIED CONTROL SYSTEM

Data monitoring center

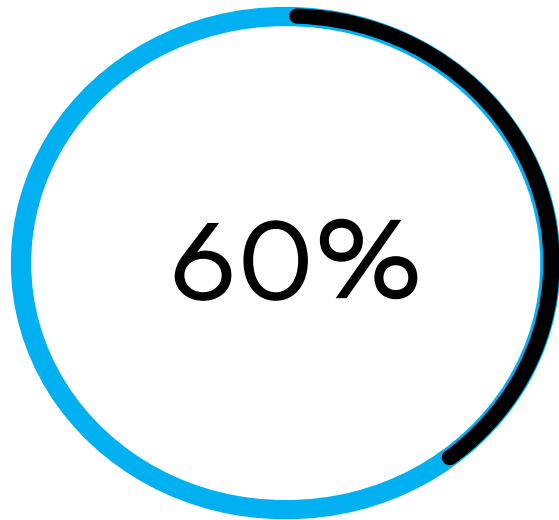


- Data from each drill rig are sent to cloud for saving, statistics and analysis of operation data.

- Computer-aided instruction allows to evaluate efficiency and identify fields for optimization.

- Monitoring and decision making in the Center on the grounds of data received in real-time mode.

////// CHALLENGES OF ROBOTIC AUTOMATION



Company's share in Russian market of DR with 225 t load capacity

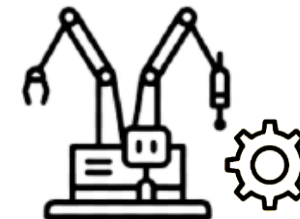
DR below 10 years' operation for on-land drilling

180 DR



Goal of Bitrobotics:

Achieving high-level automation of procedures at a drill rig with minimal alterations of architecture and structure.



WELCOME TO INTELLIGENT FUTURE

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