HMS GROUP

Engineering Flow Solutions

INTEGRATED SOLUTIONS FOR OIL & GAS

Upstream
Midstream
Downstream

CONTENTS

HMS GROUP AT A GLANCE 2

PUMPS

COMPETENCES 8
PRODUCT RANGE 9

COMPRESSORS

COMPETENCES 16
PRODUCT RANGE 17
INTEGRATED SOLUTIONS 19

OIL & GAS EQUIPMENT

COMPETENCES 20
PRODUCT RANGE 21

EPC 23

REFERENCES 25

HMS GROUP AT A GLANCE



HMS Group – a leading international holding, integrating major machine building and engineering companies. Scope of HMS Group's activities covers oil & gas industry, nuclear and thermal energy, water supply & sewage disposal, and other industries.

KEY FACTS AND FIGURES

- 4 complementary business units:
  - Industrial pumps
  - Compressors
  - Oil & gas equipment
  - EPC
- 18 manufacturing and engineering companies in Russia, CIS and Europe
- 1,400 high-skilled design engineers
- 15,000 professional employees
- Successfully implemented projects in 30 countries

CUSTOMERS & PARTNERS

ADVANTAGES OF WORKING WITH HMS GROUP



UNIQUE COMPETENCES IN ENGINEERING AND MANUFACTURING OF PUMPS, COMPRESSORS, TANKS & VESSELS, AND SKID-MOUNTED EQUIPMENT

A wide range of pumps, compressors, pressure vessels, and packaged equipment for various applications in accordance with API standards

Own research and development capabilities

Decades of proven experience

EXPERIENCE IN INTEGRATED SUPPLIES OF OWN AND OUTSOURCED EQUIPMENT INCLUDING PROCESS MODULES AND SYSTEMS ON TURNKEY CONDITIONS

Single-source responsibility

Better delivery, installation lead time, and projects commissioning

Integrated project management

Cost control and optimization

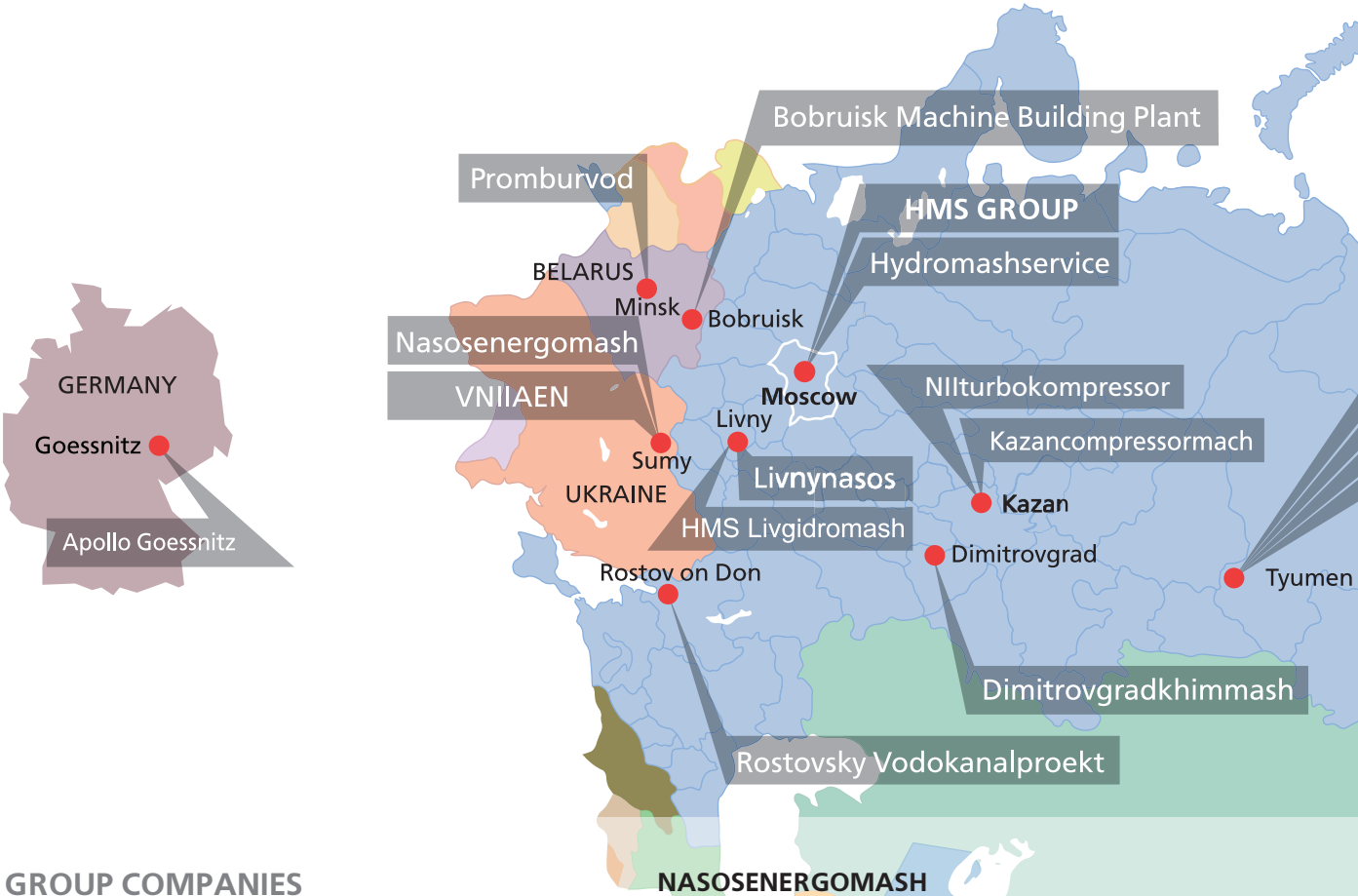
Effective risk management

FULL RANGE OF WARRANTY AND AFTER-SALES SERVICE OF PUMPS, COMPRESSORS, AND OIL & GAS FIELD EQUIPMENT

Basic service options: installation & commissioning works, warranty repair, personnel training

Extended service options: after-warranty repair, supply of spare parts & expendables, technical and engineering support, equipment retrofit and overhaul

HMS GROUP LOCATIONS



HMS GROUP COMPANIES WITH PRODUCTS AND SERVICES FOR OIL & GAS

HYDROMASHSERVICE
Founded in 1993, Moscow, Russia
Integrated commercial and engineering company of HMS Group. Supplies the equipment by the Group's companies and implements integrated turnkey projects

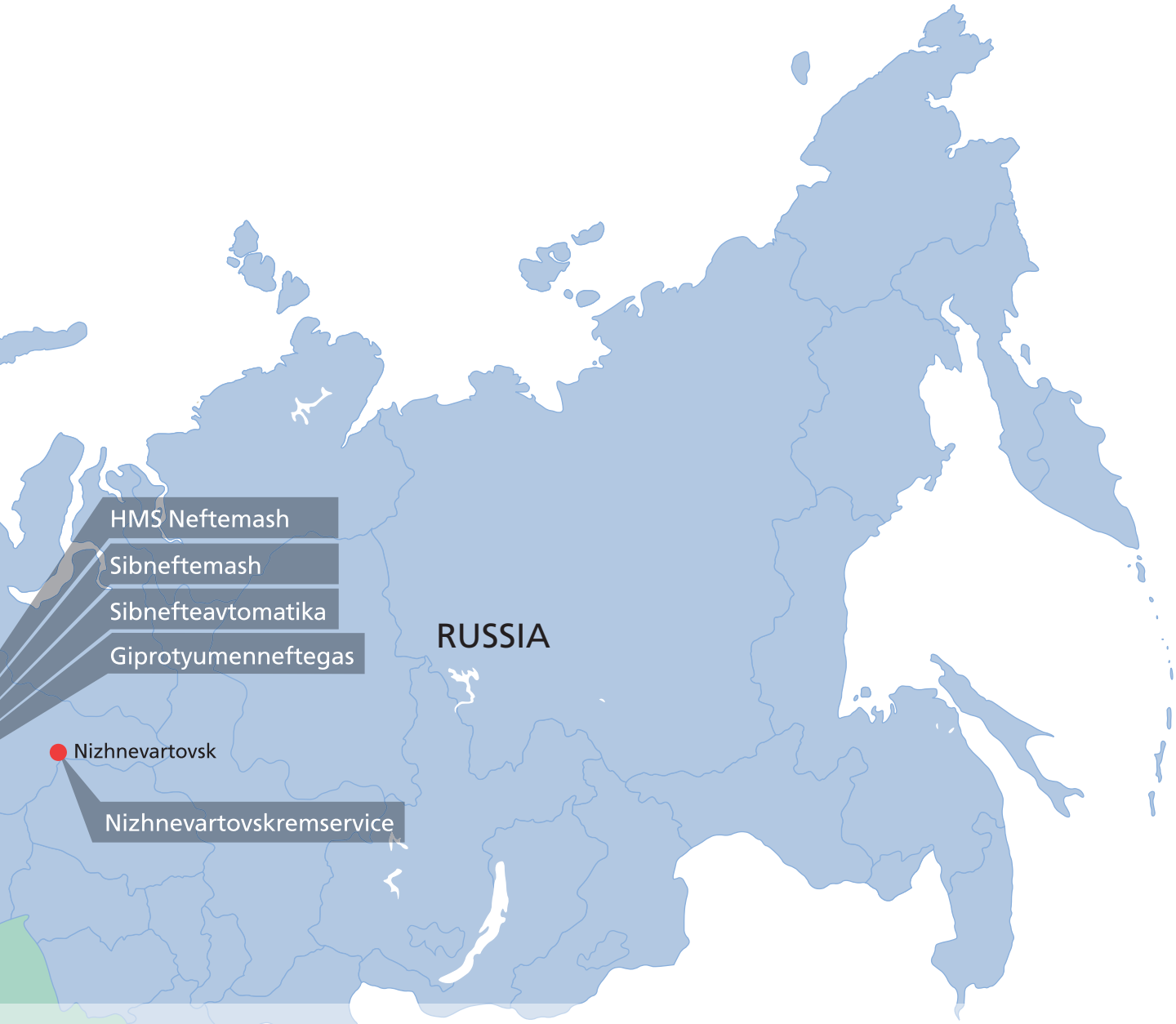
HMS LIVGIDROMASH
Founded in 1947, Livny, Russia
Manufacturing of pumps and pumping systems for oil & gas, nuclear and thermal energy, water & utilities, shipbuilding, and other industries

NASOSENERGOMASH
Founded in 1949, Sumy, Ukraine
Specializes in manufacturing of pumps and pumping systems for production and transportation of oil and petroleum products, for nuclear and thermal energy, water & utilities

BOBRUISK MACHINE BUILDING PLANT
Founded in 1898, Bobruisk, Belarus
Manufacturing of the pumping equipment for oil refining, petroleum chemistry, steel & mining, and other industries

APOLLO GOESSNITZ GmbH
Founded in 1863, Goessnitz, Germany
Manufacturing of sophisticated pumps and pumping systems for oil refining, gas processing, offshore oil & gas production platforms, thermal energy, and other industries

VNIIAEN
Founded in 1956, Sumy, Ukraine
R&D institute specializing in pump engineering for oil, gas, and power industries



KAZANCOMPRESSORMASH
Founded in 1951, Kazan, Russia
Manufacturing of compressors, gas compression systems and complete compressor stations for oil & gas and petrochemical industry

NIITURBOKOMPRESSOR
Founded in 1957, Kazan, Russia
Major R&D company of the compressor equipment engineering

HMS NEFTEMASH
Founded in 1965, Tyumen, Russia
Specializes in manufacturing of a wide range of skid-mounted oilfield equipment for oil & gas industry

SIBNEFTEMASH
Founded in 1976, Tyumen, Russia
Engineering and manufacturing of specialized oilfield equipment

SIBNEFTEAVTOMATIKA
Founded in 1986, Tyumen, Russia
Engineering and manufacturing of the flow rate metering equipment for oil, gas, and water

DIMITROVGRADKHIMMASH
Founded in 1931, Dimitrovgrad, Russia
Manufacturing of a wide range of pumps, tanks, pressure vessels, reservoirs, separators, and heat exchangers

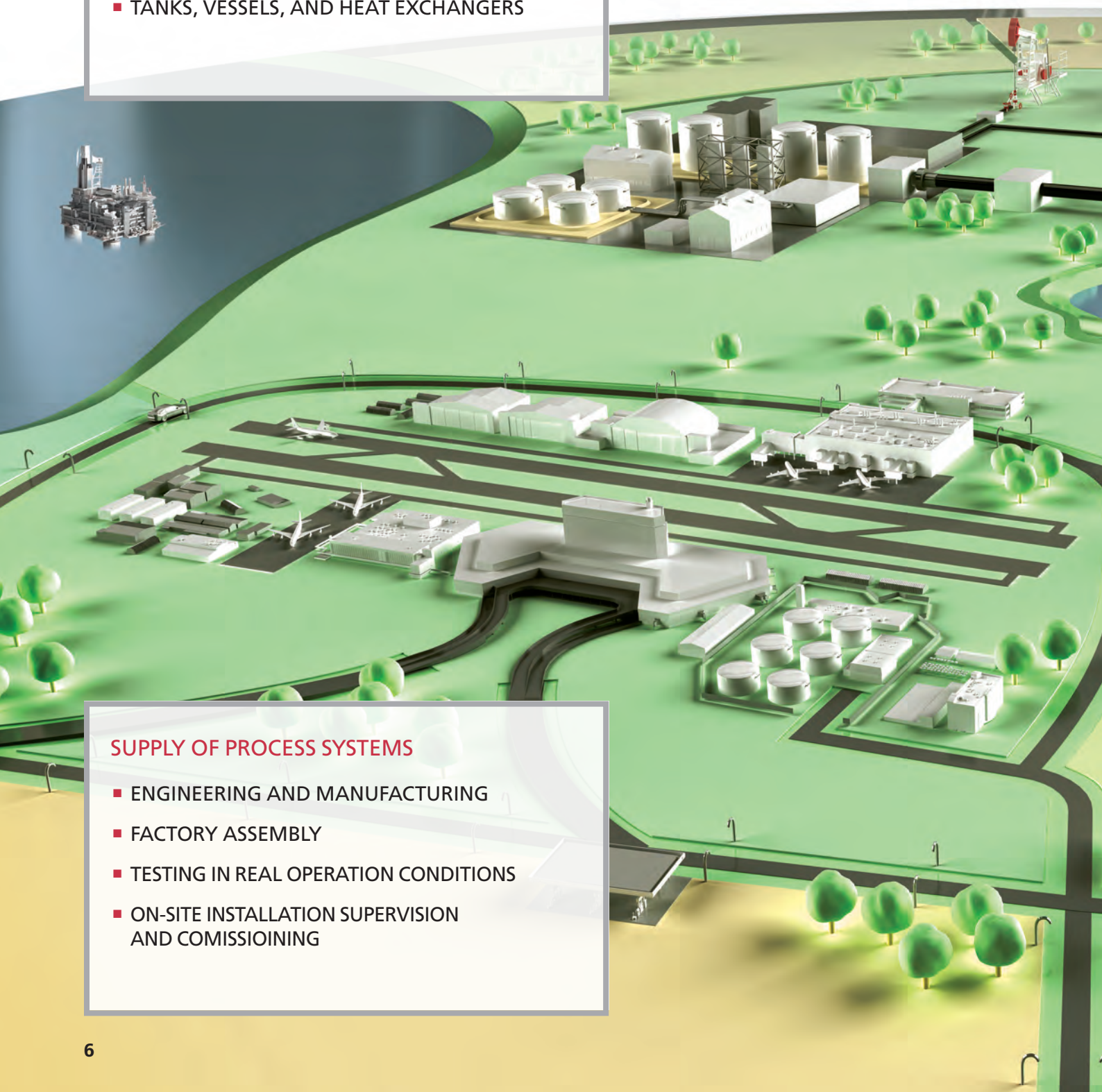
NIZHNEVARTOVSKREMSERVICE
Founded in 1998, Nizhnevartovsk, Russia
Oil pumps manufacturing and integrated service of repair, maintenance, and retrofit of pumping, drilling, and other oil & gas equipment

GIPROTYUMENNEFTEGAZ
Founded in 1964, Tyumen, Russia
FEED, basic and detailed engineering of the oil & gas field facilities complex development

HMS GROUP FOR OIL & GAS

EQUIPMENT DESIGN AND MANUFACTURING

- PUMPS AND PUMPING SYSTEMS
- COMPRESSORS AND COMPRESSOR SYSTEMS
- SKID-MOUNTED OILFIELD EQUIPMENT
- TANKS, VESSELS, AND HEAT EXCHANGERS

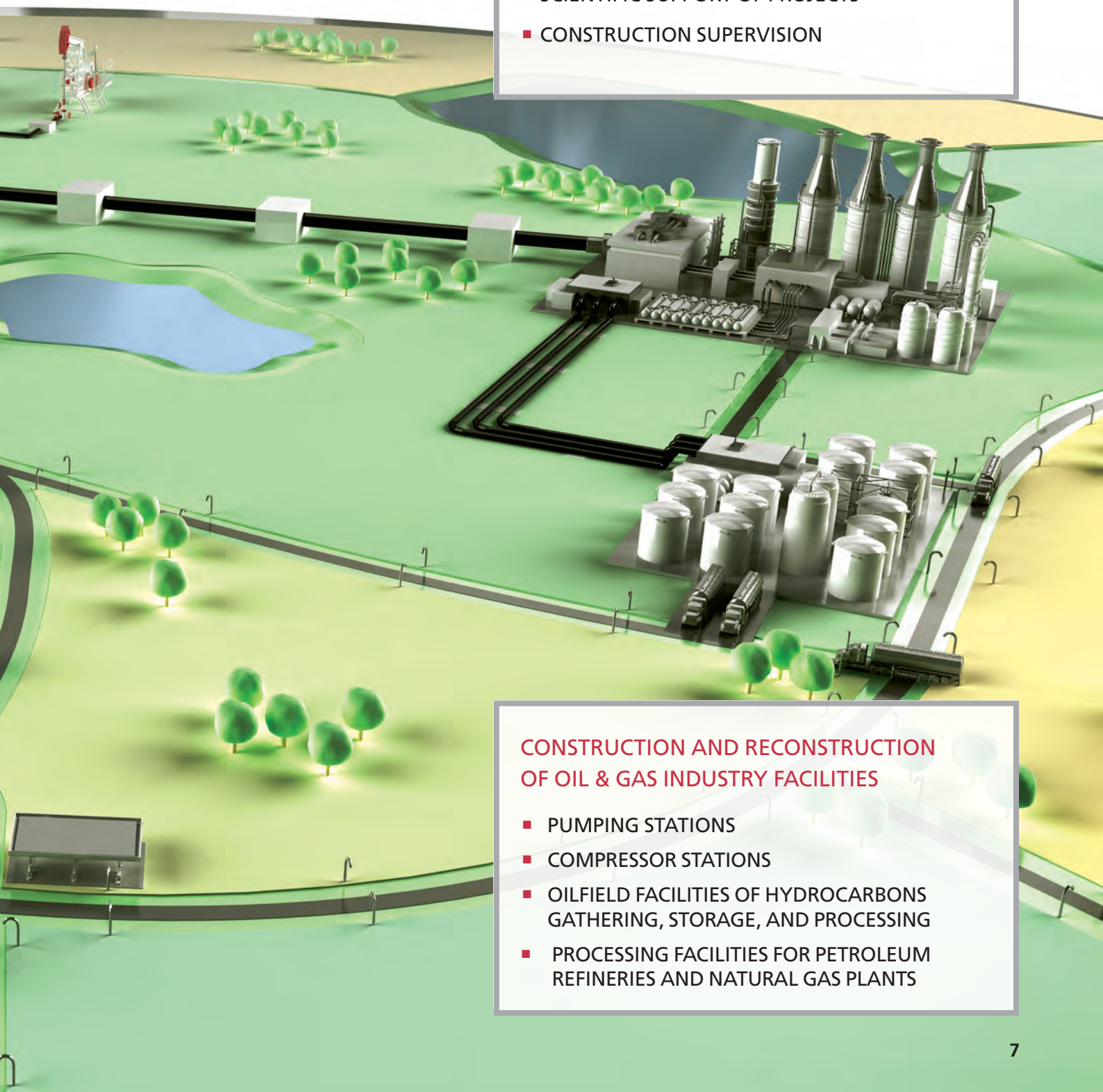


SUPPLY OF PROCESS SYSTEMS

- ENGINEERING AND MANUFACTURING
- FACTORY ASSEMBLY
- TESTING IN REAL OPERATION CONDITIONS
- ON-SITE INSTALLATION SUPERVISION AND COMISSIOINING

BASIC AND DETAILED ENGINEERING OF OIL & GAS INDUSTRY FACILITIES

- PROCESS ENGINEERING
- CONSTRUCTION AND ENGINEERING RESEARCH
- SCIENTIFIC SUPPORT OF PROJECTS
- CONSTRUCTION SUPERVISION



CONSTRUCTION AND RECONSTRUCTION OF OIL & GAS INDUSTRY FACILITIES

- PUMPING STATIONS
- COMPRESSOR STATIONS
- OILFIELD FACILITIES OF HYDROCARBONS GATHERING, STORAGE, AND PROCESSING
- PROCESSING FACILITIES FOR PETROLEUM REFINERIES AND NATURAL GAS PLANTS

PUMPS: COMPETENCES

The pumping equipment design and manufacturing is carried out by the HMS Group factories: **HMS Livgidromash**, **Bobruisk Machine Building Plant**, **Dimitrovgradkhimmash**, **Apollo Goessnitz –** the traditional suppliers for the oil & gas industry.

APPLICATION

HMS Group companies offer a wide range of the pumping equipment for all stages of production, transportation and processing of hydrocarbons:

- Upstream: oil, gas and condensate production, including offshore platforms
- Midstream: transportation of oil and petroleum products, including high-performance pumping systems for the trunk pipelines
- Downstream: processes of oil refining and petroleum chemistry, including heavy duty process pumps

RESEARCH & DEVELOPMENT

Contemporary R&D base of HMS Group is represented by four engineering centers in Russia and the CIS with centralized management and the latest software platforms based on SolidWorks, ANSYS CFX and others.

While designing the pumps and systems the HMS Group specialists are focused on high energy efficiency of proposed solutions.

MANUFACTURING

The pumping equipment, including critical components, is manufactured by the HMS Group companies equipped with up-to-date machinery from the leading manufacturers of Germany, Great Britain, and South Korea. The casing parts and impellers are fabricated in the foundries with new molding lines and induction furnaces.

TESTING

HMS Group companies have the unique equipment for in-situ testing of pumps and pumping systems in accordance with international standard ISO 9906:1999 or by special, customer-approved methods, within the following range of the main operating parameters:

- Capacity: up to 25,000 m^3/h
- Head: up to 4,000 m
- Drive power: up to 14,000 kW

SERVICE

Services include but is not limited to installation supervision and commissioning, guarantee and post-guarantee service, repair and overhaul, technical audit, retrofit of equipment and process systems, and their performance optimization.

QUALITY

The pumping equipment is manufactured in accordance with requirements of the main international standards: ISO, API, DIN, AISI, ANSI, NEMA, NORSOK.

WATER INJECTION SYSTEMS

Single-casing, radially split, multistage between-bearings (ring-section) pumps Series CNS, CNSz, CNSp (type BB4)

APPLICATION:
injection of treated water, produced / formation water, and oilfield water into formation for pressure retention

Q: up to 1,500 m³/h **H**: up to 2,400 m
T: up to + 80 °C

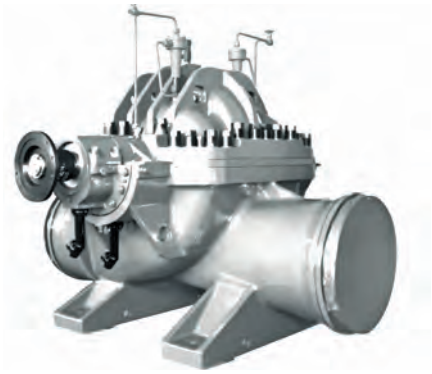
Double-casing, radially split, multistage between-bearings (barrel) pumps Series CNSDp (type BB5)

APPLICATION:
injection of treated water, produced / formation water, and oilfield water into formation for pressure retention

Q: up to 1,000 m³/h **H**: up to 2,800 m
T: up to + 400 °C

OIL AND PETROLEUM PRODUCTS TRUNK PIPELINES

Low head oil transport pumps (axially split, one-stage, between-bearings pumps) Series NM (type BB1)



APPLICATION:
transportation of oil and petroleum products via trunk pipelines

Q: up to 12,500 m³/h **H**: up to 380 m
T: up to +60 °C

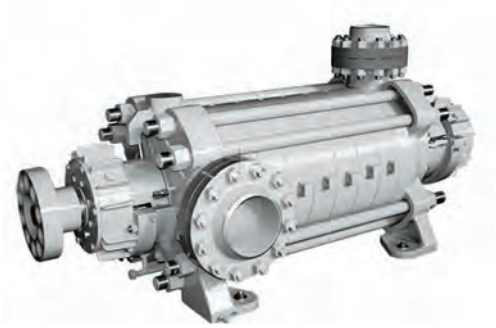
High head oil transport pumps (single/double-casing, radially split, multistage, between-bearings pumps). Series NM (type BB4, BB5)

APPLICATION:
transportation of oil and petroleum products via trunk and process pipelines

Q: up to 1,250 m³/h **H**: up to 1,100 m
T: up to + 60 °C

OIL AND PETROLEUM PRODUCTS TRUNK PIPELINES

High head oil transport pumps (single-casing, radially split, multistage, between-bearings pumps). Series CNSn (type BB4)



APPLICATION:
transportation of oil and petroleum products via trunk, process and auxiliary pipelines

Q: up to 540 m³/h **H**: up to 880 m
T: up to + 60 °C

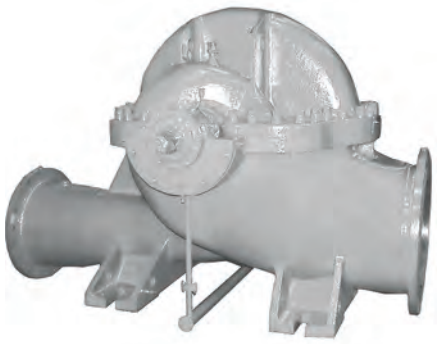
Oil transport booster pumps (double-casing, diffuser, vertically suspended pumps). Series NMV (type VS6)

APPLICATION:
transportation of oil and petroleum products via trunk and process pipelines

Q: up to 1,800 m³/h
H: up to 330 m
T: up to + 60 °C

AUXILIARY PROCESSES

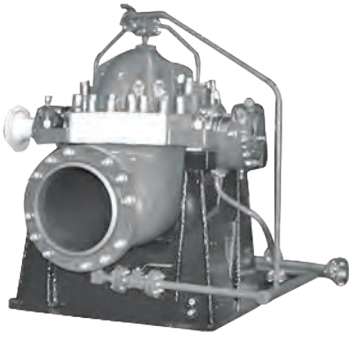
Booster and loading/unloading pumps (axially split, one-stage, between-bearings pumps) Series NDs, NDv, ND (type BB1)



APPLICATION:
booster pumps for the main oil transfer pumps; loading / unloading pump for oil terminals, petroleum products pipelines

Q: up to 1,250 m³/h **H**: up to 90 m
T: up to + 85 °C

Booster and loading/unloading pumps (axially split, one-stage, between-bearings pumps) Series NCN-E (type BB1)

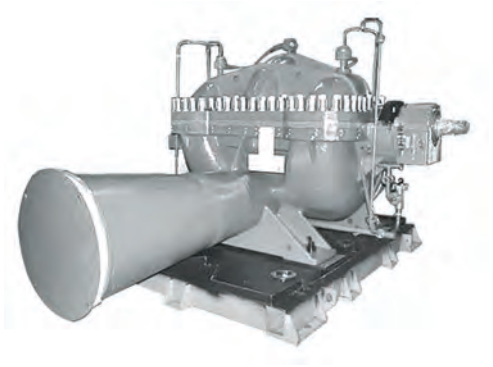


APPLICATION:
supply of oil and petroleum products to the trunk pump for cavitation-free operation; pumping of oil from the buffer reservoirs for transportation

Q: up to 1,800 m³/h **H**: up to 150 m
T: up to + 80 °C

AUXILIARY PROCESSES

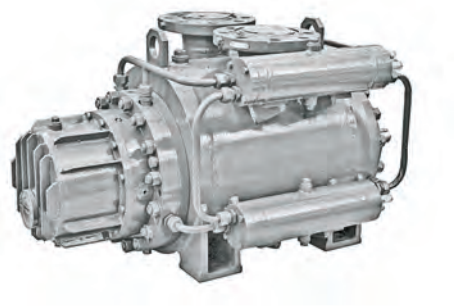
Oil transport booster pumps (axially split one-stage between-bearings pumps) Series NGPN-M (type BB1)



APPLICATION:
booster pump for the main oil transfer pumps; loading/unloading pump

Q: up to 5,000 m³/h **H**: up to 160 m
T: up to + 80 °C

Twin-screw multiphase pumps Series 2VV



APPLICATION:
pumping of oil, water and associated petroleum gas mixtures

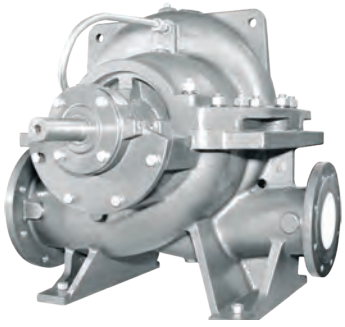
Q: up to 500 m³/h **P**: up to 25 bar
T: up to + 100 °C

Axially split, one-stage, between-bearings pumps Series D, 1D, 2D

APPLICATION:
water supply for industrial applications

Q: up to 12,500 m³/h **H**: up to 150 m
T: up to + 85 °C

Axially split, one-stage, between-bearings pumps Series HMS DeLium (type BB1)



APPLICATION:
supply of oil, petroleum products, chemically active liquids in oil refining, gas processing, chemical and petroleum chemistry industries; industrial water supply

Q: up to 10,000 m³/h **H**: up to 200 m
T: up to + 150 °C

AUXILIARY PROCESSES

Vertical booster pumps (double-casing, diffuser, vertically suspended pumps) Series NPV, NPV-M, 20NV, 24NV (type VS6)

APPLICATION:
supply of oil, petroleum products, fuel mixtures to the trunk pumps for their cavitation-free operation; operations at the oil blending facilities, loading/unloading racks, fuel storage depots

Q: up to 5,000 m^3/h
H: up to 150 m
T: up to + 50 °C

Leaks removal progressive cavity pumps Series N1V

APPLICATION:
pumping of commercial oil and petroleum products out of drainage reservoirs and delivery to a trunk pipeline

Q: up to 10 m^3/h
P: up to 100 bar
T: up to + 50 °C

Leaks removal vertical pumps (vertically suspended, ring-section multistage centrifugal pumps). Series NOU

APPLICATION:
pumping oil, water, oil-water emulsion out of tanks and reservoirs

Q: up to 70 m^3/h
H: up to 900 m
T: up to + 80 °C

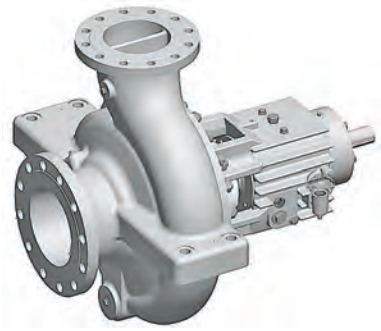
Leaks removal vertical pumps (vertically suspended, single-casing, volute, line-shaft-driven sump pumps). Series NV, NV-M (type VS4)

APPLICATION:
pumping oil, water, oil-water emulsion out of tanks and reservoirs with depth up to 15.5 m

Q: up to 50 m^3/h
H: up to 80 m
T: up to + 80 °C

PRODUCTION OF OIL, GAS AND CONDENSATE*, OIL REFINING AND PETROLEUM CHEMISTRY

Centreline-mounted , single-stage overhung pumps. Series KRH, KRHA, KRHL, KRPO, KGHL (type OH2)



APPLICATION:

oil, gas and condensate extraction processes; primary and secondary processing of oil and petroleum products, end products handling at refineries; various processes at petrochemical and gas processing plants

Q: up to 5,000 m³/h **H**: up to 350 m

T: up to + 450 °C

Centreline-mounted , single-stage overhung pumps. Series 2NK (type OH2)

APPLICATION:

extraction of oil, gas and condensate; processing of oil and petroleum products; handling of end products at refineries; processes at petrochemical and gas processing plants

Q: up to 720 m³/h **H**: up to 255 m

T: up to + 400 °C

Axially split, one- and two-stage, between-bearings pumps. Series ZMK, ZMKL (type BB1)

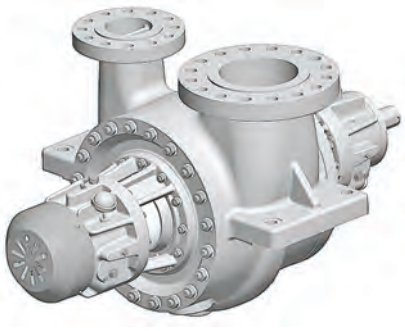
APPLICATION:

production of oil, gas and condensate; petroleum products processing at refineries, petrochemical and gas processing plants

Q: up to 10,000 m³/h **H**: up to 140 m

T: up to + 150 °C

Radially split, one- and two-stage, between bearings pumps. Series ZPR, ZPRA (type BB2)



APPLICATION:

processing of oil, petroleum products at refineries, gas processing plants and petroleum chemistry applications

Q: up to 4,000 m³/h **H**: up to 400 m

T: up to + 450 °C

* Including offshore platforms and FPSO (Floating Production, Storage and Offloading) – a floating vessel used by the offshore oil and gas industry for the production, processing of hydrocarbons and for storage of oil.

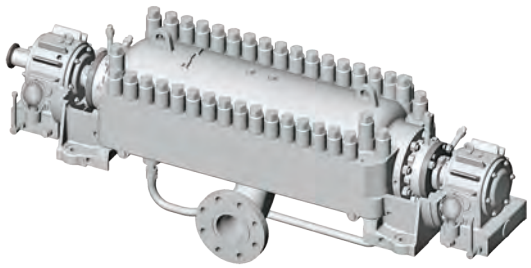
PRODUCTION OF OIL, GAS AND CONDENSATE, OIL REFINING AND PETROLEUM CHEMISTRY

Radially split, one- and two-stage, between-bearings pumps. Series KGR, KGRD (type BB2)

APPLICATION:
oil, gas and condensate extraction processes; primary and secondary processing of oil and petroleum products, end products handling at refineries; various processes at petrochemical and gas processing plants

Q: up to 1,600 m³/h **H**: up to 600 m
T: up to + 400 °C

Axially split, multistage, between-bearings pumps. Series NPS (type BB3)

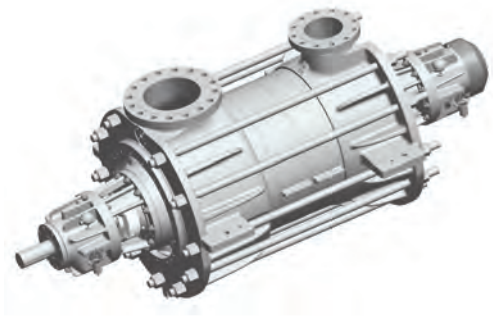


APPLICATION:
secondary processing of oil and petroleum products, end products handling at refineries; various processes at petrochemical and gas processing plants

Q: up to 3700 m³/h **H**: up to 1900* m
T: up to + 250 °C

* 2800 for high-speed arrangement

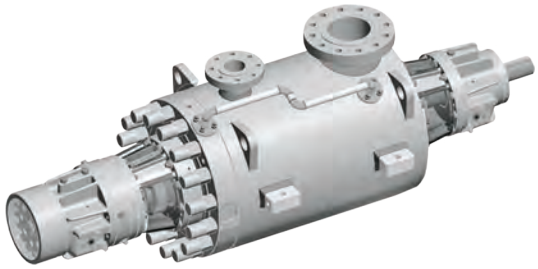
Single-casing, radially split, multistage, between-bearings pumps. Series GP, HP, GMHD (type BB4)



APPLICATION:
production of oil, gas, and condensate at offshore platforms; water injection systems; oil refineries and gas processing plants

Q: up to 1,100 m³/h **H**: up to 2800 m
T: up to + 200 °C

Double-casing, radially split, multistage, between-bearings pumps. Series TG, TGDX, TL (type BB5)



APPLICATION:
production of oil, gas, and condensate at offshore platforms; water injection systems; gas washing systems; oil refineries and petrochemical plants

Q: up to 900 m³/h **H**: up to 4,200 m
T: up to + 420 °C

PRODUCTION OF OIL, GAS AND CONDENSATE, OIL REFINING AND PETROLEUM CHEMISTRY

Vertical, in-line, single-stage overhung pumps with separate bearing brackets Series KRI, KRIL (type OH3)

APPLICATION:

extraction processes of oil, gas and condensate including offshore platforms; oil and petroleum products primary and secondary processing, handling of end products at refineries; various processes at petrochemical and gas processing plants

Q: up to 600 m³/h **H**: up to 320 m

T: up to + 385 °C

Wet pit, vertically suspended, single-casing diffuser pumps. Series HPV, HPVX (type VS1)

APPLICATION:

booster pump for supply of crude oil, petroleum products, fuel mixtures, flammable liquids from the tanks; crude oil circulation systems in processes at refineries

Q: up to 600 m³/h

H: up to 600 m

T: up to + 180 °C

Double-casing, diffuser vertically suspended pumps Series GSTV, GLKV (type VS6)

APPLICATION:

oil, gas and condensate extraction including offshore platforms; oil and petroleum products primary and secondary processing, end products handling at refineries; petrochemical and gas processing plants applications

Q: up to 3,000 m³/h

H: up to 360 m

T: up to + 160 °C

Double-casing, diffuser vertically suspended pumps Series HPTV (type VS6)

APPLICATION:

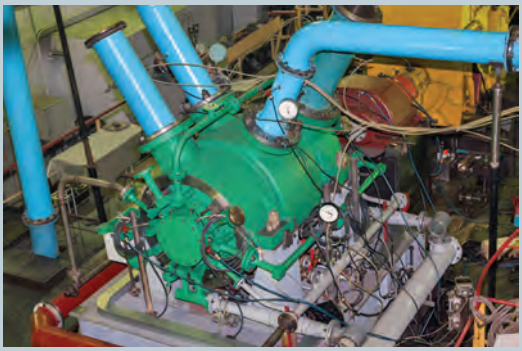
oil, gas and condensate extraction processes including offshore platforms; processing of oil and petroleum products, end products handling at refineries; petrochemical and gas processing plants applications

Q: up to 550 m³/h

H: up to 1,600 m

T: up to + 260 °C

COMPRESSORS: COMPETENCES


Engineering and manufacturing of compressors, gas compression systems, and complete compressor stations is performed by the integrated scientific and production complex of HMS Group.

The product line includes a wide range of equipment for almost all industrial gases including toxic, explosive, and corrosive ones.

RESEARCH & DEVELOPMENT

Development of compressors and compressor-based process systems is carried out by **NIIturbokompressor** – a major research & development center, situated in Kazan, Russia.

The Center's experts have designed over 420 different types of compressors supplied to various industrial facilities in Russia and over 60 countries worldwide.

DESIGN SOLUTIONS ADVANTAGES

- The newest gas dynamics calculation methods
- Systematic approach to design through parts unification and building-block concept
- Up-to-date technical solutions (dry gas seals, magnetic suspension of rotors, etc.)

MANUFACTURING AND TESTING

Compressors and compressor systems are produced at **Kazancompressormash** – one of the leading compressor manufacturing enterprises in Russia and CIS, situated in Kazan (Russia).

The production facilities are equipped with all necessary machinery for manufacturing of up-to-date and reliable compressor equipment:

- Total production area: 420,000 square meters
- Modern manufacturing equipment including machine tools and processing centers from Germany, Great Britain, Italy, Canada
- Europe's largest facility of 35 stands for complete systems testing which provides 100% control of the technical parameters during the factory test and their confirmation on operation site

SERVICE

Own service centers provide integrated after-sales servicing of the compressor equipment:

- Installation supervision and commissioning
- Design supervision
- Line maintenance
- Delivery of spare parts and accessories
- Retrofit of compressor systems
- Audit of equipment technical conditions

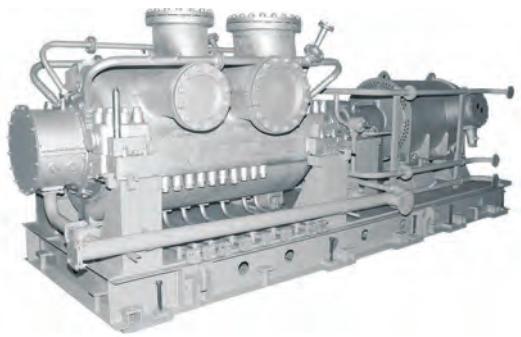
QUALITY

Integrated Management System certified in accordance with ISO 9001:2008, ISO 14001:2004, OHSAS 18001:2007 (quality management, environmental management, occupational health and safety).

The equipment is manufactured in accordance with Russian state standards and API 617 as well.

PRODUCT RANGE

Multistage centrifugal compressors with horizontally split casing



TECHNICAL DATA

Capacity: up to 1,400 m³/min (120,000 Nm³/h)

Discharge pressure: up to 45 bar (4.5 MPa)

Drive power: up to 6,300 kW

COMPRESSIBLE GASES

- Associated petroleum gas
- Fuel gas
- Hydrocarbon process gas
- Flare gas
- Hydrogen-bearing gas
- Coke oven gas
- Other industrial gases

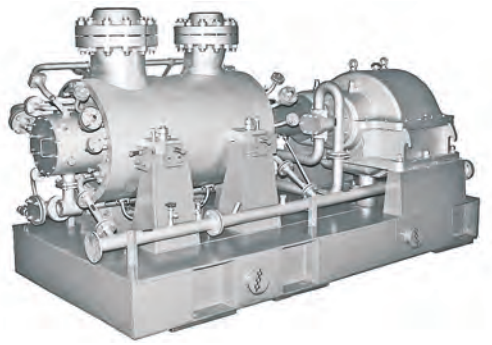
DESIGN FEATURES & ADVANTAGES

Quick and easy access to the flow path components and elements for inspection, maintenance, and repair

Low-cost and time-saving routine maintenance of bearings and seals without disassembling of the casing

Compression of flammable and sediment-forming gases

Multistage barrel-type centrifugal compressors with vertically split casing



TECHNICAL DATA

Capacity: up to 900 m³/min (220,000 Nm³/h)

Discharge pressure: up to 450 bar (45 MPa)

Drive power: up to 32,000 kW

COMPRESSIBLE GASES

- Natural gas
- Associated petroleum gas
- Fuel gas
- Hydrocarbon process gas
- Flare gas
- Hydrogen-bearing gas
- Other industrial gases

DESIGN FEATURES & ADVANTAGES

High-pressure compression of explosive gases

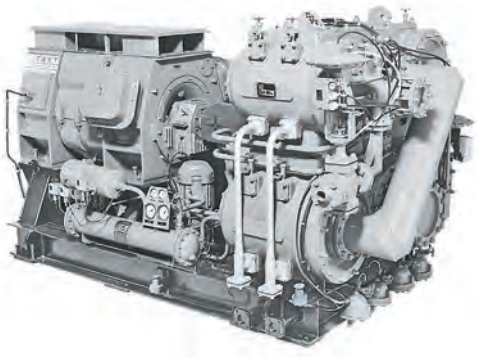
Outer casing with solid forged caps and special locks for quick and easy maintenance

High purity of compressed gas and no leaks due to dry gas seals

Active magnetic bearings for the rotor suspension

PRODUCT RANGE

Integrally geared centrifugal compressors



TECHNICAL DATA

Capacity: up to 1,200 m^3/min (80,000 Nm^3/h)

Discharge pressure: up to 50 bar (5 MPa)

Drive power: up to 8000 kW

COMPRESSIBLE GASES

- Acid hydrocarbon gas
- Associated petroleum gas
- Fuel gas
- Hydrocarbon process gas
- Refrigerants
- Other industrial gases

DESIGN FEATURES & ADVANTAGES

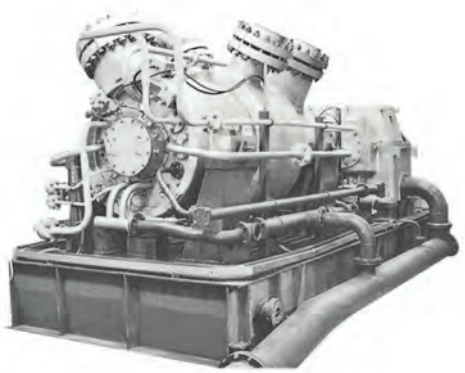
High-efficient multi-shaft compressor

A wide capacity control range 30%..110%

Compact size and footprint

Short installation lead time

Turbine powered gas pumping units



TECHNICAL DATA

Capacity: up to 1,400 m^3/min (220,000 Nm^3/h)

Discharge pressure: up to 450 bar (45 MPa)

Drive power: up to 32,000 kW

COMPRESSIBLE GASES

- Natural gas
- Associated petroleum gas

DESIGN FEATURES & ADVANTAGES

A range of the flow paths of a special design allowing their application with any drive power to obtain high polytropic efficiency within discharge pressure values of 56, 76, 85, 100 kgf/cm^2 and pressure ratio of 1.36, 1.44, 1.5, 1.7, 2,0, 2.2, 3.0.

Spatial impeller blades in a combination with the bladeless diffuser providing to 85% polytropic efficiency in the operating point and a wide range of efficient operation

COMPRESSOR-BASED INTEGRATED SOLUTIONS

Engineering of the compressor-based process solutions is performed by the specialists of **NIIturbokompressor**.

Manufacturing, assembling and testing of the compressor systems are carried out at the up-to-date facilities of **Kazancompressormash**.

APPLICATION OF GAS COMPRESSION SYSTEMS AND COMPRESSOR STATIONS

- Natural and associated petroleum gas transmission, treatment of associated petroleum gas
- Associated petroleum gas compression at processing stages
- Gas injection into formation
- Gas injection into underground storage facilities
- Gas compression at gas lift oil extraction
- Associated petroleum gas utilization
- Flare gas utilization

TECHNICAL DATA OF A SINGLE GAS COMPRESSION SYSTEM

- Capacity up to 1,400 m^3/min (3,000 million Nm^3/year)
- Discharge pressure: up to 450 bar (45 MPa)
- Drive power: up to 32 MW

COMPLETE SOLUTIONS ADVANTAGES

- Engineering, manufacturing, packaging of compressors in accordance with specific customer requirements
- Equipment versions in skids and easily constructed buildings with modular design of all systems
- Every unit is pre-assembled and tested at the factory to reduce on-site installation expenses
- Complete supply of process and auxiliary equipment for compressor stations
- Single supplier responsibility at all project stages including attainment of the given operation parameters for supplied equipment

COMPLETE SOLUTIONS REFERENCES

Customer	System type, Scope of supply	Compressible gas	Capacity*, m^3/min	Pressure, bar		Power, MW	Year of supply
				Suction	Discharge		
Stavrolen, LUKOIL (Russia)	5GC2-287/15-57 turbine powered (1 unit)	Dry stripped	287	15	57	25	2014
LUKOIL-Permnefteorgsintez, LUKOIL (Russia)	4GC2-70/17-62 turbine powered (3 units)	Dry stripped	70	17	62	6	2013
Vyngapur Gas Processing Plant, SiburTyumenGaz (Russia)	6GC-375/4-77 turbine powered (1 unit)	Associated petroleum	364	4	76	18	2012
Hariaginskoye Oilfield and Usinsk Gas Processing Plant, LUKOIL-Komi (Russia)	6GC2-260/2-38 turbine powered (5 units)	Associated petroleum	260	2	38	6.3	2010-2013
Yuzhno-Balykskiy Gas Processing Plant, SiburTyumenGaz (Russia)	66GC-1162/1.3-38 turbine powered (3 units)	Associated petroleum	1162	1	37	16	2009
	4GC2-124/14-79 turbine powered (2 units)	Dry stripped	124	14	77	8	2008
Gazprom neftekhim Salavat, Gazprom (Russia)	433GC2-143/25-321 PM (1 unit)	Hydronitric mixture	143	25	315	32	1985

* by suction conditions

OIL & GAS EQUIPMENT: COMPETENCES

HMS Group integrates the major Russian companies manufacturing a wide range of the process oil and gas equipment: **HMS Neftemash**, **Sibneftemash**, **Dimitrovgradkhimmash**, **Sibnefteavtomatika**.

APPLICATION

The manufactured equipment is widely used by the oil and gas companies in Russia and CIS in production, transportation and processing of hydrocarbons:

- Drilling, operation and maintenance of wells
- Increasing production of hydrocarbons
- Measurement of well production and commercial accounting of hydrocarbons
- Treatment of oil, gas and water
- Collection, transportation, storage and delivery of hydrocarbons
- Separation, treatment and processing of gas-liquid mixtures
- Processes of oil and gas refining facilities

RESEARCH & DEVELOPMENT

The companies of HMS Group have own engineering centers that design new equipment involving the specialists from the leading Russian institutes.

This policy allows implementing of integrated approach to design and fabrication of the process systems for oil & gas field facilities development, including supply of patented process solutions in supermodules design.

MANUFACTURING

A park of industrial machinery includes numerical control machine tools, new laboratory, metal cutting, welding, heat-treatment, painting, control, and measuring equipment.

The up-to-date manufacturing capabilities allow production of oil & gas equipment in stationary, modular and mobile versions.

The oil & gas process systems are tested at the factory in accordance with requirements of the customer.

Fabrication of equipment with long production cycle is possible in parallel with the project engineering that provides significant saving of commissioning time and total project costs (up to 25%).

SERVICE

Service divisions of HSM Group provide installation supervision and commissioning of supplied equipment and process systems, guarantee and post-guarantee service, running maintenance and overhaul, customer's personnel training.

QUALITY

The quality management system of the HMS Group divisions meets the requirements of ISO 9001:2008. All appropriate permissions of equipment application at hazardous facilities are available.

PRODUCT RANGE

Pumping stations

- Block-type cluster pumping stations
- Oil transfer stations
- Auxiliary pumping stations

Oil and water treatment facilities

- Oil treatment units
- Oil separation and transfer complexes
- Water treatment units
- Free water knock-out units

Gas treatment facilities

- Comprehensive gas treatment units
- Natural gas treatment units
- Gas distribution stations (nitrogen, oxygen)
- Condensate stabilization units

Auxiliary oilfield equipment

- Buildings for administrative, living and process purposes
- Power supply equipment and facilities
- Fire fighting stations and fire suppression systems

PRODUCT RANGE

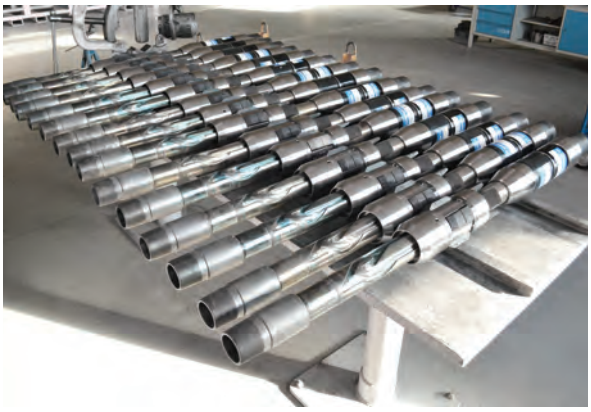
Reservoirs, separators, heat-exchangers

- Tanks and reservoirs
- Pressurized vessels
- Separators, settling tanks, electric dehydrators
- Heat exchangers, air cooling units

Oilfield equipment

- Equipment for well workover operations
- Fracturing equipment
- Stationary and mobile cement storages
- Chemical dosing units

Downhole equipment

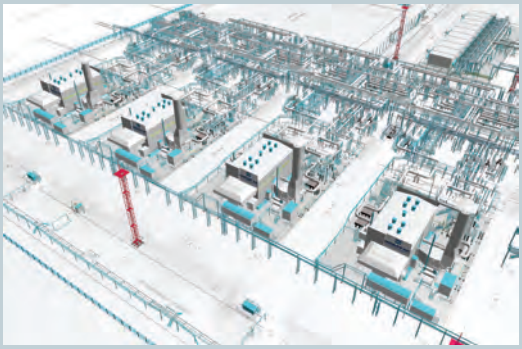


- Packers and anchors
- Downhole equipment and tools

Flow control & measurement systems

- Stationary and mobile measuring units (including units w/o separation)
- Oil quality and flow measuring units
- Water, gas and condensate flow meters

OILFIELD FACILITIES PROJECT ENGINEERING AND DESIGN



Integrated project engineering of the oil, gas, and condensate field facilities is performed by the specialists of Giprotyumenneftegaz – one of the largest in Russia and CIS project and R&D institutes of the oil & gas industry.

Considerable experience has been gained in implementation of a complete scope of works: feasibility study, FEED, basic engineering, detailed engineering, construction survey and supervision, scientific support of projects.

The up-to-date software platforms are applied for design and engineering survey: MicroStation, AutoPipe (Bentley Systems), Hysys, FLaReNet, Flow-3D; Primavera – in the project management. The uniform data are used at the all design stages.

The smart 3D engineering technologies make possible involvement of the designers into all stages of the object's life cycle: design, construction, operation, reconstruction.

Giprotyumenneftegaz has designed in Russia more than 300 oil, gas, and condensate fields at territories of the Western and Eastern Siberia, Sakhalin, the Krasnodar region and in the Komi Republic.

OBJECTS OF ENGINEERING

Extraction

— Development of productive and exploration wells clusters
— Block cluster pumping stations

Processing & treatment

— Oil and water treatment facilities
— Comprehensive gas treatment facilities
— Free water knockout systems
— Booster compressor and pumping stations
— Central collection points
— Oil transfer stations
— Petroleum products storages
— Flare systems

Transportation

— Infield and trunk pipelines for oil, gas, and condensate
— Objects and facilities for the trunk pipelines operation

Field infrastructure

— Gas turbine and gas piston electric power stations
— Water intakes, water treatment units, sewage disposal systems, process systems, and other facilities

EPC

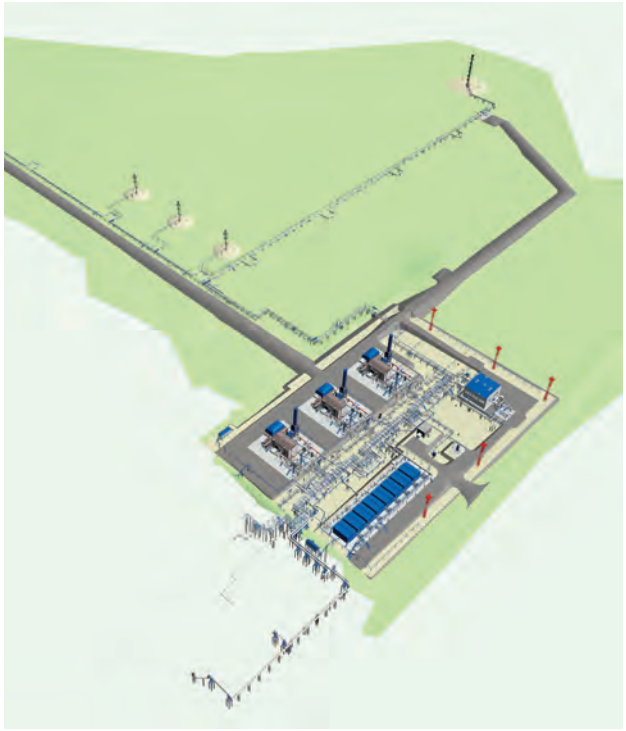


Competencies and resources of HMS Group provide optimal system of the complex projects management to ensure timely and high-quality solution of tasks that significantly increases efficiency of the implemented projects.

Project Management	Process Equipment & Systems Complex Procurement	After-Sales Service
▪ Risk management ▪ Works quality control ▪ Meeting the deadlines ▪ Installation & commissioning management ▪ Building & construction supervision ▪ Logistic support ▪ Production management	▪ Basic & detailed engineering, as-build documentation ▪ Main process equipment manufacturing ▪ Outsourcing of auxiliary systems and equipment ▪ Factory assembling ▪ Stress tests (optional) ▪ Transportation to site of operation ▪ Installation & commissioning works	▪ Technical audit and inspection ▪ Site inspection by manufacturer's representatives ▪ Servicing on site or in service centers ▪ Supply of original spare pars ▪ Optimization and adjustment of process systems

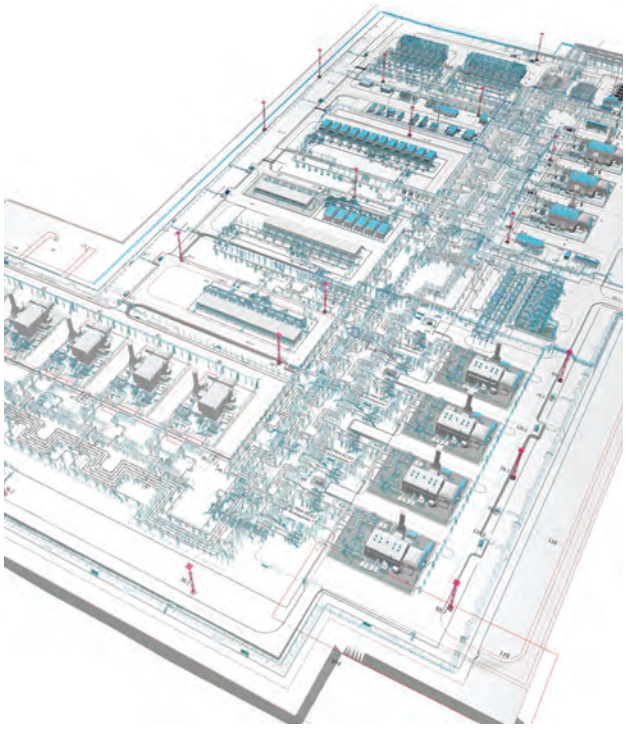
THE EAST-TARKOSALINSKOYE OIL AND GAS CONDENSATE FIELD

Customer	NOVATEK-TARKOSALENEFTEGAS
Project	Booster compressor station (2-nd stage)
Scope of works	▪ Integrated design, including site engineering investigation ▪ Construction supervision
Designed facilities	Comprehensive gas treatment unit, booster compressor station, separation unit, compressor systems area, air coolers area
Technical data	▪ Capacity: 20.8 billion Nm^3/year ▪ Discharge pressure: 77 bar
Project duration	2008



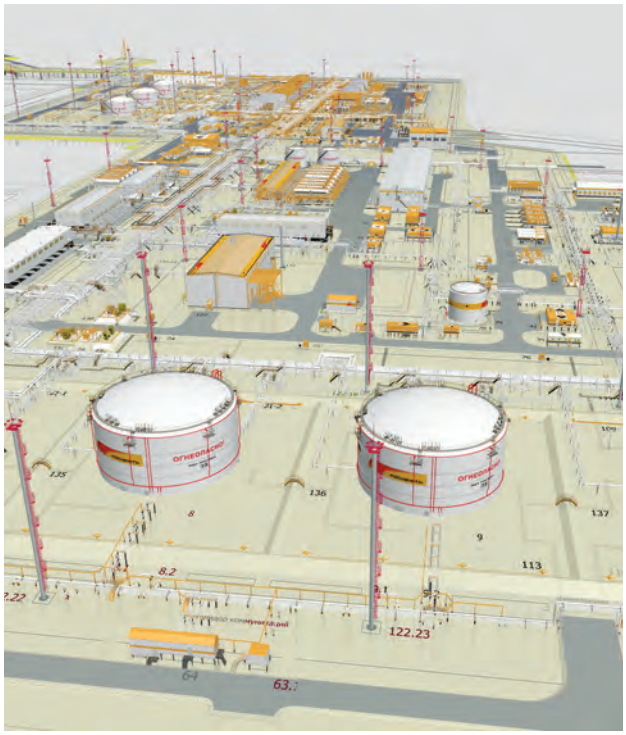
THE YURKHAROVSKOYE OIL AND GAS CONDENSATE FIELD

Customer	NOVATEK-YURKHAROVNEFTEGAS
Project	Booster compressor station
Scope of works	▪ Integrated design, including site engineering investigation ▪ Construction supervision
Designed facilities	Air compressor station, gas treatment unit, nitrogen unit, condensate pumping station, lube oil facilities, and other objects
Technical data	▪ Capacity: 30.51 billion Nm^3/year ▪ Discharge pressure: 104 bar
Project duration	2010 - 2013



THE VANKOR OIL AND GAS CONDENSATE FIELD

Customer	Vankorneft (ROSNEFT)
Project	Free water knock-out system
Scope of works	▪ Integrated design, including site engineering investigation ▪ Construction supervision ▪ Established representative office
Designed facilities	Free water knock-out system, water treatment facility, low-pressure compressor station, slop treatment facility
Project duration	2010 - 2012



THE URENGOY OIL AND GAS CONDENSATE FIELD

Customer	Gazprom Dobycha Urengoy
Project	Booster compressor station for Cenomanian deposit at the Pestsovaya area (2-nd stage)
Scope of works	Project documentation development including site engineering investigation
Designed facilities	Compressor station, gas treatment facility, fuel gas treatment facility
Technical data	▪ Capacity: 29.5 billion Nm^3/year ▪ Discharge pressure: 55 bar
Project duration	2013 - 2014

VANKOR OIL AND GAS FIELD, RUSSIA
PROCESS MODULES FOR OIL CENTRAL COLLECTION POINT



The Vankor field is one of the largest oil and gas fields (with area of about 416.5 square kilometers) in Russia, located in the northern part of the Eastern Siberia. The field is developed by Vankorneft, a subsidiary company of Rosneft.

Customer	Vankorneft (Rosneft)
Scope of works	Engineering, manufacturing, procurement, installation supervision, commissioning
Scope of supply	12 process modules of the frame-panel type
Technical data	The process module is a building of 40x16x12 meters equipped with various pumping systems, heat exchangers, measuring and auxiliary equipment
Features & advantages	▪ A high degree of prefabrication of each module facilitated significantly the equipment installation and reduced the commissioning time by 30-40% ▪ Control assembling/disassembling of all the modules at the factory before shipment ▪ Increased operational lifetime (up to 30 years) and extended warranty period (up to 4 years) for the pumps installed into the process modules
Project duration	2009 - 2012

NADYM-PUR-TAZ REGION FIELDS, RUSSIA
NGLs PRODUCTION, TRANSPORTATION AND PROCESSING COMPLEX

Nadym-Pur-Taz region is located at the territory of the Yamal-Nenets autonomous district of Russia where the main oil & gas reserves are concentrated within the large oil, gas, and condensate fields including Urengoy, Yamburg, Yuzhno-Russkoye and others.

Customer	Gazprom	
Scope of works	Engineering, manufacturing, procurement, installation & commissioning supervision	
Supplied equipment	Processing systems, skid-mounted rotating equipment, pressure vessels	
Technical data	**Object**	**Capacity**
	Gas condensate transport preparation plant (2-nd stage), Novy Urengoy	12 million tons/year
	Delivery & acceptance point of Urengoy-Purpe oil and gas condensate pipeline	10 million tons/year
	Oil transfer pumping station Urengoyskaya	10 million tons/year
	Condensate stabilization unit for Achimov horizon deposits	4 million tons/year
Features & advantages	▪ The equipment and systems are engineered in accordance with the customer requirements and site operation conditions ▪ State-of-the-art equipment with high reliability ▪ Supplied items are delivered as prefabricated easy-transportable modules ready for operation that provided minimum installation and commissioning lead time ▪ Supplier's single-source responsibility for every project stage	
Project duration	2014 - 2016	

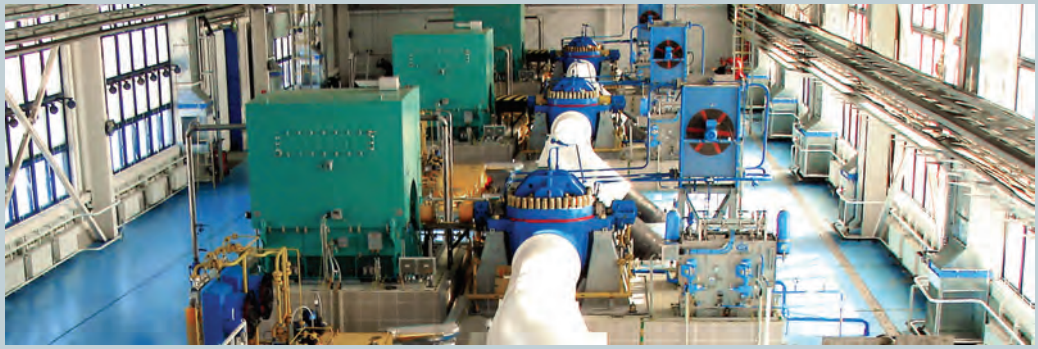
WESTERN SIBERIA – PACIFIC OCEAN PIPELINE (ESPO-1), RUSSIA EMERGENCY BACKUP OIL PUMPING STATIONS



ESPO-1 is the first phase of the Eastern Siberia-Pacific Ocean (ESPO) pipeline system, the largest trunk pipeline in Russia aimed to connect the Western and Eastern Siberia oilfields with a sea port of Kozmino in the Nakhodka Bay. The ESPO-1 pipeline, with length of 2694 km, runs from Taishet in Irkutsk region to Skovorodino in Amur region.

Customer	Transneft
Scope of works	Engineering, manufacturing, procurement, installation supervision, commissioning
Scope of supply	**Two emergency backup diesel–driven oil pumping stations:** ▪ 4 modular blocks with pumping units and auxiliary equipment ▪ 8 pumping units based on NM 500-560 pumps (BB4 type of API 610) driven by Cummins QSK60 diesel engines
Technical data	**NM 500–560 pumps** ▪ Capacity: 500 m^3/h ▪ Head: up to 560 m
Features & advantages	▪ High level of efficiency and reliability ▪ Independent operation of each pumping station with quick connection to any part of the main pipeline ▪ Easy operation and maintenance ▪ Autonomous power supply for the main and auxiliary systems by the diesel-driven electric power generators
Project duration	2009 - 2010

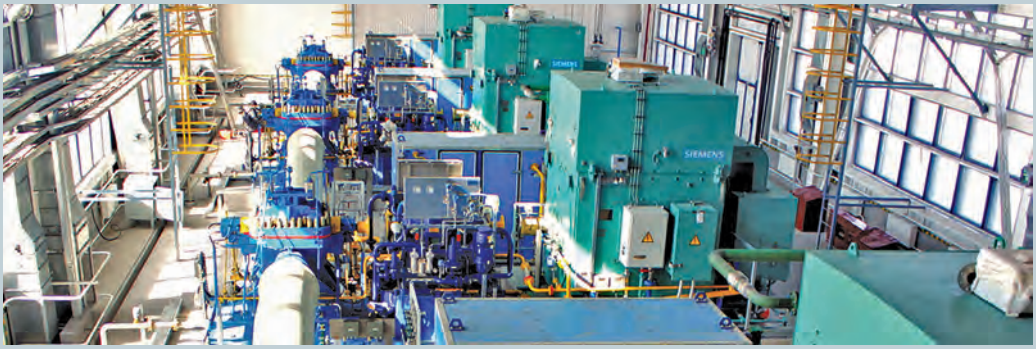
WESTERN SIBERIA – PACIFIC OCEAN PIPELINE (ESPO-1), RUSSIA TRUNK OIL PUMPING UNITS



ESPO-1 is the first phase of the Eastern Siberia-Pacific Ocean (ESPO) pipeline system construction. The ESPO-1 pipeline, with length of 2694 km, runs from Taishet in Irkutsk region to Skovorodino in Amur region.

Customer	Transneft
Scope of works	Engineering, manufacturing, testing, procurement, installation supervision, commissioning, personnel training, integrated maintenance
Scope of supply	**Supply of five oil transfer pumping stations with the following equipment:** ▪ 20 pumping units based on NM 10000-380-2 pumps (BB1 type of API 610) with variable frequency drives ▪ 234 units of auxiliary equipment
Technical data	**NM 10000–380–2 pumps** ▪ Capacity: 12,000 m^3/h ▪ Head: up to 360 м
Features & advantages	▪ Application of the up-to-date software platforms (Solid Works, ANSYS CFX) for the pumping units engineering ▪ Construction of a new testing facility for the full-scale tests of the any size trunk oil pumps at rated rotation speed ▪ Implementation of the installation and commissioning processes in severe climatic conditions ▪ Establishment of the regional representative office in Irkutsk ▪ Implementation of the project by the integrated project team including specialists of Hydromashservice (HMS Group's integrated commercial & engineering company), Nasosenergomash (HMS Group), VNIIAEN (HMS Group)
Project duration	2010 - 2013

WESTERN SIBERIA – PACIFIC OCEAN PIPELINE (ESPO-2), RUSSIA
TRUNK OIL PUMPING UNITS



ESPO-2 is the second phase of the Eastern Siberia – Pacific Ocean pipeline system. Route of ESPO-2 includes a section from Skovorodino oil pumping station to Kozmino oil seaport. ESPO-2, with over 2,000 km length, has connected East Siberia fields with a sea port in Primorye that opened up new opportunities for Russian oil export to Asia-Pacific region.

Customer	Transneft
Scope of works	Engineering, manufacturing, testing, procurement, installation supervision, commissioning, personnel training, integrated maintenance
Scope of supply	**Supply of seven oil transfer pumping stations with the following equipment:** ▪ 12 pumping systems based on NM 7000-250 pumps (BB1 type of API 610) with hydraulic couplings ▪ 16 pumping units based on NM 10000-250-3 pumps (BB1 type of API 610) with variable frequency drives ▪ 265 units of auxiliary equipment
Technical data	**NM 7000–250 pumps** ▪ Capacity: up to 7,000 m^3/h ▪ Head: up to 265 m **NM 10000–250–3 pumps** ▪ Capacity: up to 10,000 m^3/h ▪ Head: up to 250 m
Features & advantages	▪ Application of the up-to-date software platforms (Solid Works, ANSYS CFX) for the pumping units engineering ▪ Using of hydraulic couplings and variable frequency drives for high energy efficiency and variable performance of the pumping units within given operation range ▪ Testing of the pumping units at the factory stand with rated operation speed ▪ Establishment of the HMS Group regional representative office in Khabarovsk ▪ Implementation of the project by the integrated project team including specialists of Hydromashservice (HMS Group's integrated commercial and engineering company), Nasosenergomash (HMS Group), VNIIAEN (HMS Group)
Project duration	2010 - 2012

PURPE-SAMOTLOR PIPELINE, RUSSIA
TRUNK OIL PUMPING UNITS

The Purpe-Samotlor trunk oil pipeline is the first phase of the Zapolyarje-Purpe-Samotlor oil pipeline construction, with a purpose to increase oil supply from the Yamal-Nenets Autonomous District and the northern part of Krasnoyarsk region to the oil refineries in Russia and to the foreign markets.

Customer	Transneft
Scope of works	Engineering, manufacturing, full-scale factory testing, procurement, installation supervision, commissioning
Scope of supply	**Supply of two oil transfer pumping stations with the following equipment:** ▪ 8 pumping systems based on NM 7000-250-3.1 pumps (BB1 type of API 610) with variable frequency drives ▪ 24 items of auxiliary equipment
Technical data	**NM 7000–250–3.1 pumps** ▪ Capacity: up to 7,000 m^3/h ▪ Head: up to 250 m
Features & advantages	▪ Application of the up-to-date software platforms (Solid Works, ANSYS CFX) for the pumping units engineering ▪ Optimization of the pumps flow parts for high energy efficiency ▪ Commissioning of the oil transfer pumping stations and the pipeline system 5 months ahead of schedule ▪ Establishment of the HMS Group regional representative office in Nefteyugansk ▪ Implementation of the project by the integrated project team including specialists of Hydromashservice (HMS Group's integrated commercial & engineering company), Nasosenergomash (HMS Group), VNIIAEN (HMS Group)
Project duration	2010 - 2011

RUMAILA OIL FIELD, IRAQ
PUMPING EQUIPMENT FOR WATER TREATMENT FACILITY



The water treatment facility of Qarmat Ali provides reliable supply of water for injection systems at Rumaila oilfield.

Customer	BP Iraq NV
Scope of works	Project audit, manufacturing and supply of the main and auxiliary equipment, repair and retrofit of operated equipment, installation supervision and commissioning, acceptance tests
Scope of supply	▪ Pumping equipment with spare parts and expendables: ▪ 4 main pumps D 6300-27 ▪ 2 main pumps CN 3000-197 ▪ 10 supplementary pumps ▪ Auxiliary equipment, piping and fittings, elements of the water intake structure
Technical data	**D 6300–27 pumps** ▪ Capacity: up to 6,300 m^3/h ▪ Head: up to 27 m **CN 3000–197 pumps** ▪ Capacity: up to 3,000 m^3/h ▪ Head: up to 197 m
Features & advantages	▪ High design reliability and efficiency of the pumping systems ▪ Maintenance without dismantling off the pipelines ▪ Exact matching of impeller diameter to the customer requirements ▪ Refurbishment of auxiliary equipment of the water treatment facility ▪ Repair and retrofit without shutting down the water treatment facility ▪ Compliance of works with corporate and project standards of BP
Commissioning	Phased, within 2012 - 2014

RUMAILA OIL FIELD, IRAQ
WATER INJECTION PUMPS FOR CLUSTER PUMP STATION



The water injection pumps for the cluster pump station (CPS) are intended for formation pressure retention at the Rumaila oil and gas field in the south of Iraq.

Customer	BP Iraq NV
Scope of works	Manufacturing, factory testing, procurement, installation supervision commissioning, acceptance tests
Scope of supply	8 main water injection pumps CNS 500-1900 (BB4 type of API 610), including: ▪ Coupling with coupling guard ▪ Installation fixture & tools ▪ Operational spare parts ▪ Auxiliaries, piping and fittings 4 CPS pump/motor skid bases incorporating lubrication oil tank
Technical data	**CNS 500–1900 pumps** ▪ Capacity: 500 m^3/h ▪ Head: 1900 m
Features & advantages	▪ API 610 / ISO 13709:2009 compliance with customer-approved deviations ▪ Reliable design with decades of proven operational reliability ▪ High-strength stages casings of chromium steel ▪ Single-suction in-line arranged impellers with corrosion-resistant wearing rings ▪ Single mechanical seal as the end rotor's sealing option ▪ Forced lubrication with pressure lube oil unit ▪ Full compatibility with existing baseplates and motors
Commissioning	2014 - 2015

RUMAILA OIL FIELD, IRAQ
ELECTRIC MOTORS FOR CLUSTER PUMP STATION

The electric motors are intended for driving the water injection pumps and auxiliary machinery at Rumaila oilfield cluster pump station (CPS).

Customer	BP Iraq NV			
Scope of works	Procurement, installation and commissioning supervision, acceptance tests			
Scope of supply	▪ 10 main synchronous electric motors STD-4000-2T4 ▪ 2 asynchronous electric motors DAZO13-70-10T2 ▪ 3 synchronous electric motors SDNZ 15-76-6T3 ▪ 2 thyristor exciters STSN-2-E-115-315 and matching transformers ▪ Installation fixtures ▪ Spare part and auxiliaries			
Technical data		**STD–4000–2T4**	**DAZO13–70–10T2**	**SDNZ 15–76–6T3**
	Power, kW	4000	320	3200
	Voltage, V	6000	6000	6000
	Rotation speed, rpm	3000	720	1000
Features & advantages	▪ Extended operational lifetime ▪ High performance and operational reliability ▪ Low-cost and easy maintenance ▪ Reliable automation and controls ▪ Low-power control signals ▪ Small footprint and easy installation			
Commissioning	2015			

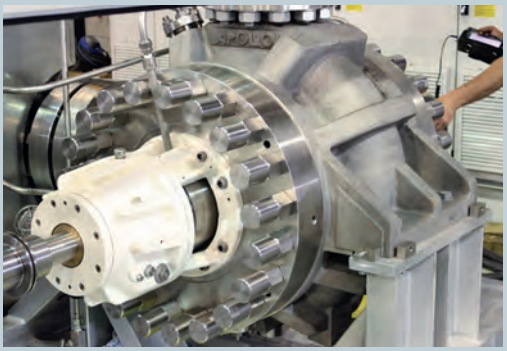
WEST QURNA-2 OIL FIELD, IRAQ
PUMPING UNITS FOR WATER INJECTION SYSTEM

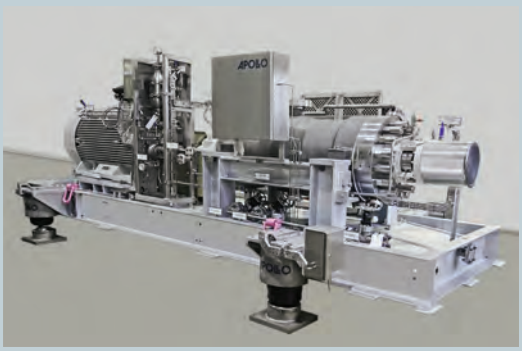


The West Qurna-2 is one of the largest undeveloped fields in the world in terms of its hydrocarbon reserves contained in two major formations, Mishrif and Yamama located in southern Iraq, 65 km Northwest of the major port city of Basra. The field is being developed by a consortium of contractors including LUKOIL and the national Iraqi South Oil Company.

Customer	LUKOIL Mid-East Ltd (LUKOIL Overseas)	
Scope of works	Engineering, manufacturing, factory testing, supply, installation and commissioning supervision	
Scope of supply	Supply of complete pumping units for sea water injection systems ▪ 7 high pressure water injection pumping units based on double-casing multistage centrifugal pumps CNSDp 240-1422 (BB5 type by API 610) ▪ 2 low pressure water distribution pumping units based on axially split between-bearings centrifugal pumps ZMK-400/700-618/CN (BB1 type by API 610)	
Technical data	**CNSDp 240–1422** ▪ Capacity: 286 m^3/h ▪ Head: 1388 m	**ZMK–400/700–618/CN** ▪ Capacity: 2640 m^3/h ▪ Head: 136 m
Features & advantages	▪ Cartridge design of the double-casing pumps with back-to-back impellers arrangement ▪ Heavy duty Super Duplex steel construction material ▪ Double mechanical seals with lockup system ▪ Mean time between overhauls (MTBO): over 40000 hours ▪ Casing parts service life: over 30 years ▪ Full compliance with API 610 (ISO 13709:2009), API 682, API 614, API 670, API 661, NORSOK M-650 standards	
Year of supply	2015	

GUDRUN OIL AND GAS PRODUCTION PLATFORM, NORWAY
PROCESS PUMPING UNITS





Gudrun oil and gas field, located in the middle of the North Sea, was discovered in 1974. The field operator is Statoil. The reservoir is located at a depth of 4,200-4,700 meters, and originates from the Jurassic Age. The pressure in the reservoir is about 860 bar and the temperature approaches 150 degrees.

Customer	Statoil
Scope of works	Engineering, manufacturing, factory testing, procurement
Scope of supply	**Supply of complete heavy-duty process pumping units:** ▪ Multistage double casing pump TGD-50B/14-708/CN (BB5 type of API 610) ▪ Volute-casing pumps ZPR-150/400 with double-flow impeller (BB2 type of API 610)
Technical data	**TGD-50B/14-708/CN pump** ▪ Capacity: up to 800 m^3/h ▪ Head: up to 2,600 m **ZPR-150/400 pump** ▪ Capacity: up to 1,500 m^3/h ▪ Head: up to 400 m
Features & advantages	▪ Heavy-duty duplex steel design for severe application conditions ▪ Short downtime and easy maintenance of BB5 pumps without dismantling off the pipelines due to cartridge-type casing ▪ Ultra high suction pressure BB2 pumps designed for 153 bar ▪ Application of noise enclosure and air controlled antivibration dampers ▪ Compliance with API 610 and NORSOK standards ▪ Factory witness testing of complete pumping units with the customer-approved motors
Project duration	2011 - 2012

YUZHNO-BALYKSKIY GAS PROCESSING PLANT, RUSSIA
COMPLETE COMPRESSOR STATION



The Yuzhno-Balykskiy gas processing plant (Khanty-Mansi Autonomous District) – is one the main enterprises of SiburTyumenGaz (SIBUR) of associated petroleum gas processing.

Customer	SiburTyumenGaz
Scope of works	Engineering, manufacturing, procurement, installation supervision, commissioning
Scope of supply	▪ 3 gas compression systems based on 66GC-1162/1.3-38 centrifugal compressor driven by a 16 MW gas turbine ▪ Skid-mounted equipment on turn-key conditions
Technical data of a single gas compression system	▪ Capacity: 700 million Nm^3/year ▪ Suction pressure: 1.3 bar ▪ Discharge pressure: 38 bar ▪ Drive power: 16 MW ▪ Gas turbine drive type: NK-16 STD
Application	Compression of low pressure associated petroleum gas and mixture of gases after oil separation for further processing
Design features	▪ Double casing compressor ▪ Dry gas seals with floating graphite rings
Solution features	▪ High degree of prefabrication of the compressor station blocks ▪ Minimal scope of installation works due to a modular design ▪ Handling of associated petroleum gas of a wide range of composition ▪ Single-source responsibility of general designer and supplier
Commissioning	2012

VYNGAPUR GAS PROCESSING PLANT, RUSSIA
COMPLETE COMPRESSOR STATION



The Vyngapur gas processing plant (SiburTyumenGaz) processes associated petroleum gas from the Gazprom Neft fields into the dry stripped gas and a broad fraction of light hydrocarbons.

Customer	SiburTyumenGaz
Scope of works	Engineering, manufacturing, procurement, installation supervision, commissioning
Scope of supply	A complete compressor station including: ▪ Gas compression system based on 6GC2-375/4-77 centrifugal compressor with a gas turbine drive ▪ Skid-mounted equipment on turn-key conditions
Technical data of a single gas compression system	▪ Capacity: 780 million Nm^3/year ▪ Suction pressure: 4 bar ▪ Discharge pressure: 76 bar ▪ Drive power: 18 MW ▪ Gas turbine drive type: NK-16-18 STD
Application	Compression of low pressure associated petroleum gas
Design features	▪ High performance due to efficient compression sages in a single casing ▪ Dry gas seals of a compressor rotor ▪ Surge protection and regulation systems with bypass valves
Solutions features	▪ Supply of equipment as completely prefabricated modules ready for operation ▪ Minimal scope of installation works due to a modular design ▪ Single-source responsibility of general designer and supplier
Commissioning	2012

HARIAGINSKOYE OILFIELD AND USINSK GAS PROCESSING PLANT, RUSSIA COMPLETE COMPRESSOR STATIONS

The Hariaginskoye oilfield (Nenets Autonomous District) is located in 60 km from the Arctic Circle in areas with permafrost soil.

Usinsk gas processing plant (Republic of Komi) processes and transports associated petroleum gas from Hariaginskoye, Voseyskoye, Usinskoye, and Kyrtaelskoye oilfields.

Customer	LUKOIL-Komi
Scope of works	Engineering, manufacturing, procurement, installation supervision, commissioning
Scope of supply	▪ 2 gas compression system 6GC2-260/2-38 GTU with a 6.3 MW turbine drives for Hariaginskoye oil field ▪ 3 gas compression system 6GC2-260/2-38 GTU with a 6.3 MW turbine drives for Usinsk gas processing plant ▪ 4 fuel gas preparation systems based on TAKAT 14.5-27 compressor system ▪ Skid-mounted equipment on turn-key conditions
Technical data of single gas compression system	▪ Capacity: 250 million Nm^3/year ▪ Suction pressure: 2 bar ▪ Discharge pressure: 38 bar ▪ Drive power: 6.3 MW
Application	Compression of low pressure associated petroleum gas from the oil & gas fields
Design features	▪ High performance due to efficient compression stages in a single casing ▪ Dry gas seals of a compressor rotor ▪ Integrated heat recovery system of exhaust gases with performance control ▪ Surge protection and regulation systems with bypass valves
Solutions features	▪ Supply of equipment as completely prefabricated modules ready for operation ▪ Single-source responsibility of general designer and supplier
Commissioning	2014

LUKOIL-PERMNEFTEORGSINTEZ, RUSSIA
TURBINE-DRIVEN GAS COMPRESSION SYSTEMS



LUKOIL-Permnefteorgsintez processes associated petroleum gas coming from oilfields of LUKOIL-PERM and raw hydrocarbons from subsidiaries of LUKOIL located in the Western Siberia.

Customer	LUKOIL-Permnefteorgsintez			
Scope of works	Engineering, manufacturing, supply, installation supervision, commissioning			
Scope of supply	▪ 3 turbine-driven gas compression systems 4GC2-70/17-62 GTU ▪ 2 unique compressor refrigerating systems GCMZ-250/0.9-15.8 ▪ 1 modular containerized compressor system 3GC2-83/25-48K ▪ 1 rotary-screw compressor system 6GV-14.16-35M3			
Technical data		**4GC2-70/17-62 GTU**	**3GC2-83/25-48K**	**6GV-14.16-35M3**
	Capacity, m^3/min	70	83.5	13.8
	Suction pressure, bar	1.7	2.46	1.6
	Discharge pressure, bar	6.2	4.7	3.4
	Drive power, MW	6	3.2	0.6
Application	▪ Delivery of dry stripped gas into a trunk gas pipeline and to the power unit ▪ Compression of propane in a cold producing system ▪ Compression of associated petroleum gas			
Design features	▪ High-efficient compressor flow part in a single case ▪ Dry gas seals of a compressor rotor ▪ Gear pair of the screw compressor with peripheral speed of 39 m/sec			
Solution features	▪ Supply of maximally prefabricated equipment ▪ Provision of automatic control and regulation systems ▪ Provision of the surge protection and firefighting systems ▪ Single-source responsibility of the general designer and supplier			
Commissioning	2014			

SYZRAN OIL REFINERY, RUSSIA
COMPRESSOR SYSTEMS FOR PROCESS GASES



Syzran oil refinery is located in the Samara region being a part of the Samara group of the Rosneft's refineries.

Customer	Rosneft		
Scope of works	Engineering, manufacturing, supply, installation supervision, commissioning		
Scope of supply	Complete compressor systems based on centrifugal axially split compressors: ▪ 42GC2-275/1.9-18 driven by the electric motor ▪ 5GC2-216/14-26 driven by the steam turbine		
Technical data		**42GC2-275/1.9-18**	**5GC2-216/14-26**
	Capacity, m^3/min	275	216
	Suction pressure, bar	1.9	14
	Discharge pressure, bar	18	26
	Drive power, MW	3.1	4.5
Application	Compression of process hydrocarbon and hydrogen-containing gases		
Design features	▪ High-efficient stages of a compression section flow part ▪ High reliability and efficiency of structural elements proven by long-term operation at site conditions		
Solution features	▪ The technical data is confirmed by successful tests at the own testing facility ▪ Minimum installation expenses due to axially split casing design		
Commissioning	2015		

OFFSHORE STATIONARY PLATFORM PRIRAZLOMNAYA, RUSSIA
COMPRESSOR SYSTEMS FOR ASSOCIATED PETROLEUM GAS

The Prirazlomnaya platform is an ice-resistant oil-producing platform designed for development of the Prirazlomnoe field in the Pechora Sea shelf. Oil production from the Prirazlomnoye field started in December 2013.

Customer	Gazprom Neft			
Scope of works	Engineering, manufacturing, supply, installation supervision, commissioning			
Scope of supply	Complete systems based on vertically split centrifugal compressors ▪ 32GC2-52/2-29M3.1 (1 unit) ▪ 5GC2-310/0.66-5M3.1 (1 unit) ▪ 3GC2-46/6-35M3.1 (1 unit)			
Technical data		**5GC2-310/0.66-5M3.1**	**32GC2-52/2-29M3.1**	**3GC2-46/6-35M3.1**
	Capacity, m^3/min	310	52	46
	Suction pressure, bar	0.6	2	6
	Discharge pressure, bar	5	29	35
	Drive power, MW	1.6	2.5	2.0
Application	▪ Compression and delivery of associated petroleum gas to the gas turbine ▪ Compression and delivery of absorbing (hydrocarbon) gas to the stripping column for crude oil purification from the sulfur-containing impurities			
Design features	▪ Compact, detachable integrated lube oil system placed inside the base frame ▪ Dry gas seals of a compressor rotor ▪ Elastic dampers for vibration and noise protection			
Solution features	▪ Packaging of the compressor systems into a single unit ▪ Compliance with requirements to design materials and explosion protection ▪ Design, manufacture, testing and certification under supervision of the Russian Maritime Register inspectors			
Commissioning	2014			

NOTES

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