Company Overview

• Research and Design Institute for Oil and Gas Field Development, Limited Liability Company, (Russian acronym: NIPI ONGM) was founded in 2008 as a spin-off from ZAO NTK ModulNefteGasKomplekt (Russian acronym: MNGK) – a leader in the development and supply of specialty equipment for oil producers. An independent entity was formed to address the increasing demand for engineering services and the need to deliver the services to better quality standards and within tighter schedules.

• NIPI ONGM’s business activities cover virtually all areas of engineering including comprehensive design and development of oil, gas and gas condensate fields, design of tank farms, loading/unloading racks, transport and protective facilities, electricity generating buildings and structures, as well as oil refineries and gas processing plants.

• NIPI ONGM conducts research and develops engineering solutions to ensure that the oil and gas facilities to be designed and upgraded meet the most up-to-date technical standards and requirements.

• Engineering solutions developed by NIPI ONGM address environmental challenges seeking to maximize associated gas utilization and to minimize environmentally harmful emissions and discharges.
Key Business Focus Areas

- COMPREHENSIVE DESIGN AND DEVELOPMENT OF OIL, GAS AND GAS CONDENSATE FIELDS, DESIGN OF TANK FARMS, LOADING/UNLOADING RACKS AND OIL REFINING AND GAS PROCESSING FACILITIES, PETROCHEMICAL PLANTS.

- ENGINEERING STUDIES AND PROCESS DEVELOPMENT.

- COMPREHENSIVE ENGINEERING SURVEYS.

- DESIGN OF TRANSPORT AND PROTECTIVE FACILITIES, ELECTRICITY GENERATING BUILDINGS AND STRUCTURES.

- DESIGN, MANUFACTURE AND SUPPLY OF OIL AND GAS EQUIPMENT AND PRODUCTION FACILITIES.

- DEVELOPMENT OF AND REGULATORY APPROVALS FOR PROCESS PROCEDURES FOR OIL PRODUCTS AND PETROCHEMICALS PRODUCTION.
NIPI ONGM provides a comprehensive package of engineering services including development of oil, gas and gas condensate fields, oil product supply enterprises, design of loading/unloading racks, oil refineries, gas processing plants and petrochemical facilities. It has all of the resources and expertise required to:

- prepare technical design assignments and specifications;
- develop technical and commercial proposals/quotations, justifications of investments and feasibility studies;
- develop Basis of Design within the scope sufficient to commence engineering design;
- develop project documentation (basic design documentation) in accordance with the requirements set out in Russian Government Decree #87 “On the Composition of Design Documentation Sections and Requirements for their Contents” including other documentation established by Russian regulatory acts;
- develop detailed design documentation;
- develop engineering documentation;
- provide project engineering support;
- provide designer’s (“author’s”) supervision support during start-up, commissioning and pilot operation to ensure that the facility is in stable operation;
- develop and obtain approvals for process procedures for production and operation.
NIPI ONGM provides engineering design support for the construction of new high-tech facilities and sophisticated systems, as well as for the existing facilities to be retrofitted / upgraded including development of bases of design within the scope required by the project design. Our continuous research efforts and studies have brought forth new engineering solutions in the following areas:

| Oil, Gas & Water Gathering & Treatment | • Hydrocarbon gas and gas condensate treatment and processing  
• Oil & gas condensate treatment to strip out H2S and mercaptans  
• Separation of wet crude oil and foamy oil  
• Optimized operation of oil/gas gathering pipelines |
| Oil & Gas Transportation | • Transportation of corrosive fluids (including sour gases)  
• Thermal treatment of heavy and high-viscosity oil for subsequent transportation |
| Oil Refining & Petrochemicals | • Deep refining of crude hydrocarbons to produce fuel, bitumen and petrochemicals  
• Refining of heavy oils and shale hydrocarbons to produce distillate fuels and bitumen |
| Environmental Protection & Conservation | • Wastewater treatment and secondary treatment of tail gases from oil refining and petrochemical facilities  
• Energy-efficient technologies and equipment  
• Technologies to utilize up to 95% and more of associated gas |

Research efforts undertaken by our personnel are reflected in over 300 articles published in industry and academic journals.
NIPI ONGM is actively engaged in a patenting process to have its new engineering ideas patented.

- RF Patent # 2343277. Oil & Gas Separator with FWKO System.
- RF Patent # 2428239. Separation Unit.
- RF Patent # 2378033. Separation Unit.
- RF Patent # 2315645. Separation Unit.
- Useful Model Patent #111257. Oil Heater.
- RF Patent # 2413752 Method to process heavy crude hydrocarbons.
- RF Patent # 2398811 Method to process heavy crude hydrocarbons.
- RF Patent # 2465304 Method to stabilize gas-saturated oil.
- RF Patent # 2417814. Settling Vessel with a liquid hydrophobic filter to remove oily formation water.
- RF Patent # 2470212 Method to treat high-viscosity and paraffin oil to be transported via pipelines.
- RF Patent # 2470213 Method to treat high-viscosity and paraffin oil to be transported via pipelines.
NIPI ONGM has an Engineering Surveys Department that provides the following services:

- Geotechnical investigations
- Environmental Surveys
- Hydrometeorological Surveys
- Geophysical Surveys
- Topographical Surveys

The Department includes 58 engineers: land surveyors, hydrometeorologists, geologists, geophysicists, environmental engineers.

The Engineering Surveys Department is equipped with transport and special machinery required to provide engineering surveys in various conditions: in conditions of Extreme North, in built-up territories, on sites of operating facilities, and it also has all required software, instruments and equipment.
NIPI ONGM today is a solid team of highly-skilled Design Engineers and Scientists including a Doctor of Engineering Sciences, Candidates of Sc. in Engineering and Chemistry, qualified Design Engineers and Surveyors, Technical Translators’ Pool, CAD Implementation Specialists and others. As of the 30th of May 2017, its workforce numbers 457 people taking into account all additional subdivisions.

ENGINEERING DEPARTMENTS:
- Process Dept - 61;
- Oilfields Engineering Dept – 25;
- Industrial and Environmental Safety Dept (HSE) - 16;
- Electrical Dept - 14;
- Automation, Telemetry & Communication Systems Dept (Instrumentation) - 29;
- Underground Utilities & HVAC Engineering Dept - 17;
- Civil and Structural Engineering Dept – 28;
- Plot Plan and Transportation Dept - 8;
- Cost Estimate and Construction Management Plan development Dept – 24
- Land surveying Dept - 9

Subdivision for design of transport and protective facilities, electricity generating buildings and structures - 60.

REGIONAL OFFICES in Orenburg and Salavat
NIPI ONGM has all required Certificates, Permits and Licenses including:

- SRO Certificate by the Nonprofit Partnership “Bashkir Society of Architects and Designers” permitting to perform design work impacting the safety of capital construction facilities including high hazard facilities and technically sophisticated installations;
- SRO Certificate by the Nonprofit Partnership “OboronStroiizyksania” permitting to perform engineering survey operations;
- License for operations involving information classified as a state secret.
NIPI ONGM has implemented and operates successfully under a Quality Management System (QMS), which is consistent with GOST R ISO 9001-2011 and confirmed by a Certificate of Conformity and regulated by QMS documents.
Leading oil & gas and engineering companies are among NIPI ONGM’s core partners and customers including:

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Customer: **Technip ITALY S.p.A. (Italy, Rome)**
Project: Heavy Oil Hydrocracking Complex, First Phase.
   The facility is currently under construction in Burgas (Bulgaria) by LUKOIL Neftokhim Burgas AD.
Project: Development of FEED documentation for Delayed Coker Unit.

Customer: **Absheron Operating Company Limited division**
   **(Baku, Azerbaijan Republic)**
Project: Construction of a FWKO Unit to support a reservoir pressure maintenance project to be implemented in Govsany-3 Field.

Customer: **Foster Wheeler (Madrid, Spain)**
Project: Booster Compressor Station in Syskonsyn’in Gas Field.

Customer: **Vinci Construction Grands Projets, (Paris, France)**
Project: Design calculations support for the construction of tanks.

Customer: **NIS a.d. NOVI SAD (Novi Sad, Republic of Serbia)**
Project: Finishing operating systems documentation RN Pancevo. Elaboration of the operational part of the plan of localization in emergency cases.
NIPI ONGM uses advanced engineering software including an upper-level 3D modeling system SmartPlant 3D developed by INTERGRAPH, a worldwide leader in this segment.

Our company has experience in working with 3D modeling system PDS under the regulations and procedures of one of the largest international corporations TECHNIP.

This software package applied in combination with the proven procedures enhances the quality of issued design documentation several-fold. Equipment drawings and specifications based on 3D models, executed in real scale and as per GOST requirements, fully eliminate mistakes from project documentation.
H-Oil Hydrocracking Complex. Phase 1. Burgas (Bulgaria).

Work in progress. Panoramic View.
Development of Wells Infrastructure in Eastern part of Orenburg Oil Gas Condensate field. Phase 2. OOO Gazprom Neft Orenburg

Field Well Site.
Comprising: construction of 36 well pads, 10 single producing wells, 26 injection wells, construction of pipelines with a total length of 300km, 110/35/6kV Substation including a 100km 6kV power line, construction of 80km of in-field roads.

Oil and Gas Treatment Unit.
Comprising: separation equipment, gas dehydration for the gas-lift oil recovery system, oil treatment (dewatering, desalting), gas compression for external transportation, tank farm, and auxiliary equipment.
Capacity:
Oil 2944.4 KTA.
Liquids 4085.5 KTA.
Associated gas 3457.0 mscm p.a.
Gas-lift 400 cubic meters per tonne.

The key challenge of the project was sour gas with H2S concentration of up to 9 vol.%, which called for additional safety measures.
Development of Eastern part of Orenburg Oil Gas Condensate field. Phase 5 and 6. Oil and Gas Treatment Unit area. OOO Gazprom Neft Orenburg.
Development of Eastern part of Orenburg Oil Gas Condensate field. Phase 5 and 6. Oil and Gas Treatment Unit area. OOO Gazprom Neft Orenburg.
Development of Eastern part of Orenburg Oil Gas Condensate field. Phase 5 and 6. Oil and Gas Treatment Unit area. OOO Gazprom Neft Orenburg.
Comprising:
- Inlet Separators;
- Associated Gas Amine Treatment Unit to strip out H2S and CO2;
- Gas and Gas Condensate Adsorption-based Dehydration and DMC Unit.

Key Performance Parameters:
- facility capacity for associated gas – 300 million nm3/year;
- associated gas is stripped of H2S compounds and dehydrated to be fed to Low-temperature Rectification Unit and Ethane Recovery Unit.
NIPI ONGM is one of the leaders in the engineering design industry with a strong expertise in developing the design of oil and gas fields, as well as process and other facilities operated in the oil and gas processing, petrochemical and chemical industries. Its primary objective, among other things, is to ensure that the existing and new facilities operating in Russia meet world standards in their technical and environmental performance.

Over 100 research and survey studies have been completed by NIPI ONGM to date.

NIPI ONGM works cooperatively together with nearly all large oil and gas companies operating in West and Eastern Siberia, in European Russia, in the Republics of Kazakhstan and Azerbaijan, in EU member countries (Bulgaria), in the Republic of Serbia.

NIPI ONGM exercises the functions of a General Design Contractor whose role is to lead and manage the team effort to generate engineering design deliverables worth 300 million rubles and more.
Severe construction conditions – permafrost, extremely low temperatures, limited vehicle access (no roads in warmer season) and marshy terrain.

The design of the oil treatment facility in Kolvinsky Oilfield was completed within a very tight schedule. Core process equipment purchase and installation proceeded in parallel with the work on the design and estimate documentation.

To supply electric power to the facility, an independent stand-alone system was developed that included a Power Park based on a Diesel and Gas-Piston Power Generator, Distribution Systems, Transformer Substations and Power Lines.

Extensive use of package-type equipment accelerated construction dates while reducing the costs. The facility completed is a high-tech production facility with a high level of automation that meets all industrial and environmental safety requirements.
This field development project was complicated by the physical and chemical properties of the crude produced here:

- heavy oil;
- high-viscosity oil;
- high-paraffin oil.

Oil treatment challenges encountered here include:

- paraffins high melting temperature (+55°C);
- asphaltenes and significant amounts of resins present in the crude oil act as water-oil emulsion stabilizers and inhibitors and slow down the mass exchange, coalescence and sedimentation processes for gaseous impurities and water globules, and lead to defoaming processes;
- oil foaming tendency (highly foaming oils).
Oil Treatment Plant with Preliminary Water Knock Out Unit for crude produced in Central Khorveyesk Platform oilfields

Scope of Supply:
Oil Treatment Plant with Preliminary Water Knock Out Unit located in Central Gathering Station area designed to gather oil products from Central Khorveyeskaya Platform wells, Packages #1, 2, 3, 4.

Capacity:
3 MTPA.
Booster Compressor Station in Syskonsyn’in Gas Field. OOO Foster Wheeler

Basic Performance Parameters:

- Capacity 2.8 mln. Scmd;
- Inlet gas pressure 3.5 MPa;
- Outlet gas pressure 10.0 MPa.
Booster Compressor Station in Syskonsyn’in Gas Field. OOO Foster Wheeler
Basic performance characteristics:
- Operating pressure - up to 5.5 MPa;
- Maximum capacity - up to 500 K nm3/day.

The design allows:
- an additional low-temperature separator to be connected to be able to run in parallel with the existing separator or independently (as a back-up unit);
- an additional recuperative gas-gas heat exchanger to be integrated to be able to operate in parallel with the existing separator or independently (as a back-up unit).
The project covers well completion design for Production Well-157-P, as well as construction of an Oxygen & Nitrogen Station in Sabetta village, a gas pipeline network from the producing wells to the Automated Gas Distribution Station and from the Automated Gas Distribution Station to Sabetta Airport.

**Main process parameters of Well-157-P:**
- Operating pressure – up to 5.5 MPa;
- Well gas flow rate – up to 450 Knm3/day

**Main process parameters of the Automated Gas Distribution Station:**
- Operating pressure - up to 1.2 MPa.
Production Well 157-P Process Flow Diagram

Facilities Layout.
Transportable N2-O2 Unit and Automated Gas Distribution Station
At NIPI ONGM we are:

- fully prepared and able to deliver the highest level of quality for our design and survey operations involving primary and auxiliary production facilities;

- equipped with resources to develop and supply reliable and highly efficient packaged equipment, as well as to provide logistical and technical support;

- able to bring reliable business partners on board to perform specific kinds of work;

- flexible to make customer requested modifications in the proposed engineering solutions;

- fully committed to honoring all of our contractual obligations.
Thank you for your attention.