



Service company LLC «NPK «MONOMER»



The basis of the company's Limited Liability Company «Scientific and Production Company «MONOMER» is the development of innovative technologies and their practical application in the oil and gas industry.

Based on many years of research and practical experience in this field, we produce equipment, field reagents, demulsifiers, anti-turbulence, oil additives, and provide oil services.

- Development, manufacture, implementation of technologies, equipment for the extraction and transportation of hard-to-recover oil.
- Development of technologies, equipment, provision of services for the return to the recycle, homogenization of bottom sediments in commodity tanks, with subsequent use by oil companies.
- Development of technologies, provision of services, cleaning of heat exchange equipment, scrubbers, tanks, settling tanks.
- Synthesis, search for new materials for the production of oilfield reagents. Laboratory studies of oil for the selection of reagents.



TECHNOLOGIES, EQUIPMENT FOR THE EXTRACTION AND TRANSPORTATION OF HARD-TO-RECOVER OIL

Stationary, mobile acoustic resonance-pulse mixer «MONOMER-SHELF»

Purpose: changing the aggregate state of hard to recover oil in the process mining and transportation.

The acoustic resonance-pulse mixer «MONOMER-SHELF» according to the contract was mounted on the well No.3 CDNG No.2 «Zhirnovsky» LLC «RITEK».

Parameters of operation of well No. 3 before the start of work: $R_b = 84$ atm, $R_z = 74$ atm, $R_l = 12$ atm, $D_{sht} = 7$ mm. $Q = 161$ m³/day, 134 t/day. The pour point of oil is +27 °C. Watering = 0.4%.

Launch of the «MONOMER-SHELF» installation.

Pressure at the entrance to the installation «MONOMER-SHELF» $R_{vx} = 15-16$ atm.

The pressure at the outlet of the installation «MONOMER-SHELF» $P_x = 4-5$ atm.

Linear pressure at the wellhead $R_l = 20-22$ atm.

Parameters of well No. 3 operation during the operation of the Shelf installation: $R_b = 84$ atm, $R_z = 74$ atm, $R_l = 22$ atm, $D_{sht} = 7$ mm. $Q = 161$ m³/day, 134 t/day. The pour point of oil is 3 °C.

As a result of the operation of the acoustic resonance-pulse mixer «MONOMER-SHELF» LLC NPK «Monomer» at the joint venture «Novokrasino» in the period 01.07.2018 to 01.07.2019, the efficiency of the installation was noted, as a result of which the mixture of oil during filling and its discharge from tankers at the reception point was not accompanied by complications associated with oil solidification. Previously, these complications daily caused additional costs for warming up tankers when draining with the help of foam, and there was also a need to carry out weekly cleaning of the submersible pump at the oil intake point.

During the period from 01.07.2018 to 01.07.2019, $Q = 58765$ m³/year, 48910 t/year was extracted, transported and delivered at this well in combination with the operation of the acoustic resonant pulse mixer «MONOMER-SHELF».

The operation of the acoustic resonance-pulse mixer «MONOMER-SHELF» is considered relevant, this equipment and technology provides the possibility of extraction and transportation of high-viscosity oils with a high content of ASF without additional heating.



TECHNOLOGIES, EQUIPMENT, PROVISION OF SERVICES FOR THE HOMOGENIZATION OF BOTTOM SEDIMENTS IN OIL TANKS, THEIR RETURN TO INDUSTRIAL RECYCLING, FOLLOWED BY RETRAINING AND PROCESSING BY A NEUTRON COMPANY

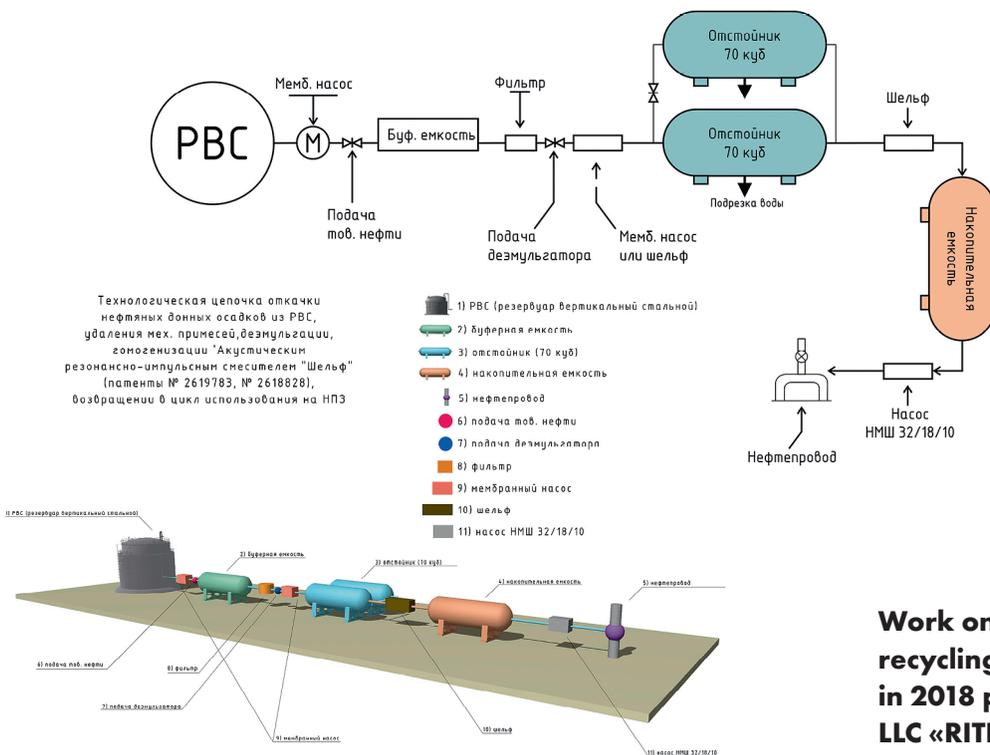
LLC «NPK «MONOMER» offers a proven technology:

– for the homogenization of bottom sediments in oil tanks, their return to the recycle, as well as the rejection of their disposal and associated costs, the rejection of the standard disposal procedure, i. e. the physical loss of bottom sediments in connection with their transfer for disposal;

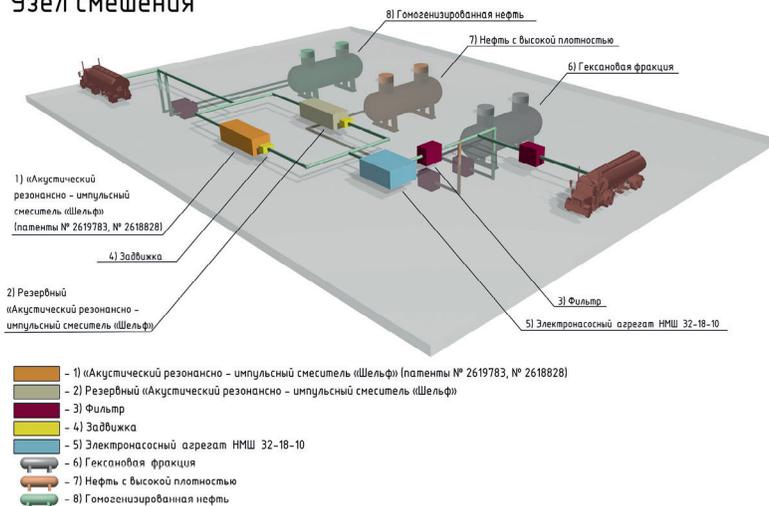
– for the homogenization and pumping of bottom oil residues with the use of own equipment, on the territory of oilfield facilities.

To change the aggregate state of bottom sediments, LLC «NPK «MONOMER» uses an acoustic resonant pulse mixer «MONOMER-SHELF» with a circulation pump in the technological chain of pumping bottom sediments. This technology will allow you to create a homogeneous (homogeneous) structure that is stable in time, excluding a return to its original state.

Schematic diagram of the arrangement of equipment of LLC «NPK «MONOMER»



Узел смешения



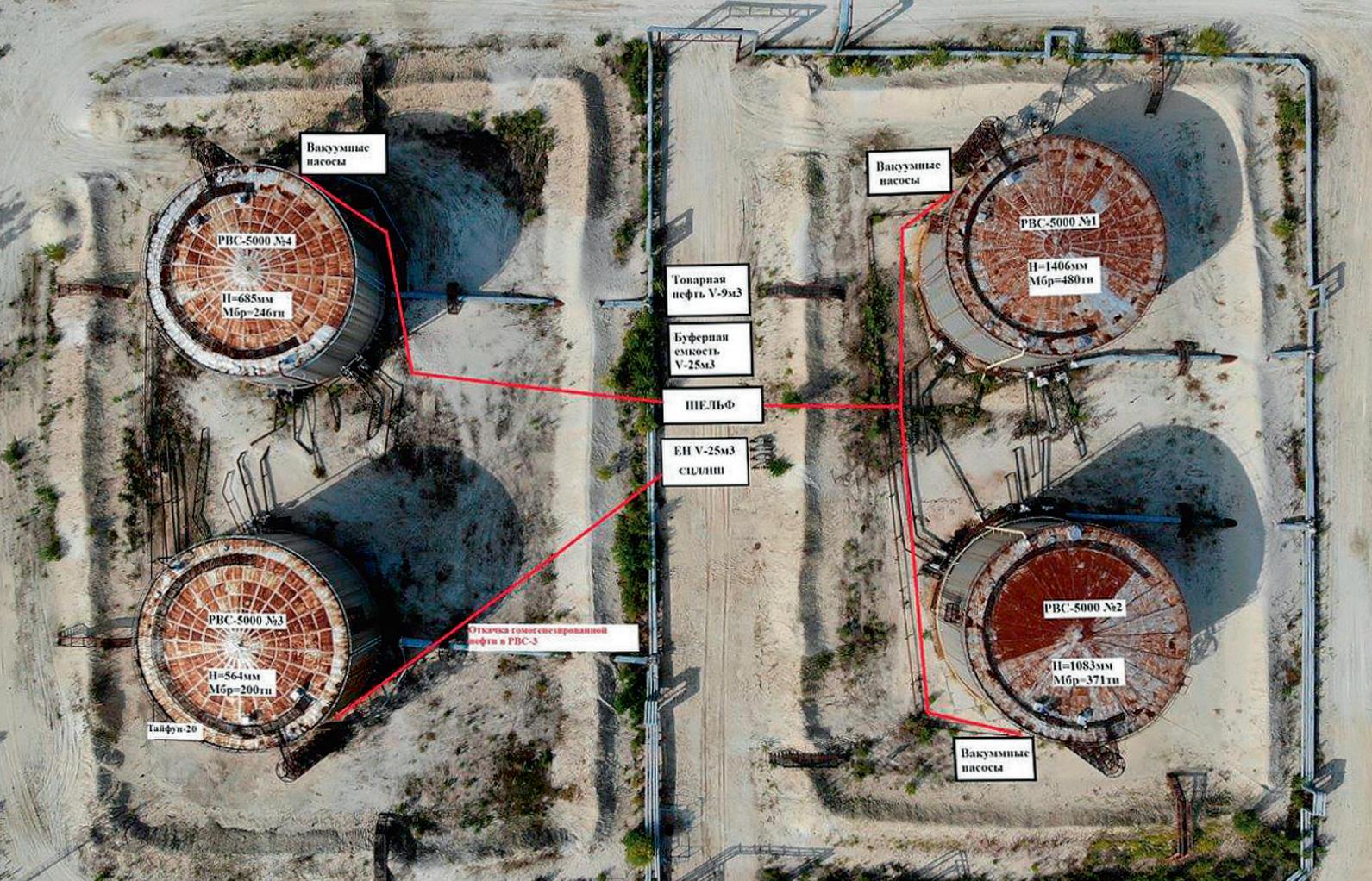
Work on the return to the recycling of oil sludge in 2018 performed on objects LLC «RITEK»:

– Initial quantity 3 265 587 tons;

– 2 968 716 tons were returned to the recycle;

– 296.871 tons were disposed of UPN of the Serginsky field, Peony Andra, UPN of the Sandibinsky field, UPN of the Kislorskoye field, CCI Volgogradneftegaz.





An example of the placement of equipment for the homogenization of bottom sediments on UPN of the Kislorskoye field

1. THE CLASSICAL SCHEME OF WASTE DISPOSAL:

3 265 587 t × 2000 rub/t (cost of extraction from an oil tank)	= 6 531 174,00 rubles
3 265 587 t × 7000 rub/t (the cost of disposal of bottom sediments)	= 22 859 109,00 rubles
Irretrievable physical loss of bottom sediments (exported for disposal from the territory of the oil company to the Contractor's landfill).	
Financial losses of the oil company	= 29 390 283,00 rubles

2. PROVEN TECHNOLOGY OF HOMOGENIZATION OF BOTTOM SEDIMENTS «MONOMER-SHELF».

Expenses:

3 265 587 t × 2000 rub/t (cost of extraction from an oil tank)	= 6 531 174,00 rubles
3 265 587 t × 8000 rub/t (cost of homogenization)	= 29 385 000,00 rubles
296,871 t × 7000 rub/t (sludge, fur impurities — disposal)	= 2 078 097,00 rubles
	= 37 994 271,00 rubles
2 968 716 tons of oil × 22,000 rub/t (sold to TRANSNEFT)	= 65 311 752,00 rubles
Profit: 65 311 752,00 – 37 994 271,00	= 27 317 481,00 rubles



Out of 3,265.587 tons of bottom sediments intended for utilization and physical loss of this volume with the help of the technology and equipment used by «SHELF», the oil company was returned to the recycle and sold by the oil company LLC «RITEK» to TRANSNEFT 2,968.716 tons of oil of the first category, the profit of the oil company was **=27 317 481,00 rubles.**



TECHNOLOGIES, EQUIPMENT, PROVISION OF SERVICES, CLEANING — HEAT EXCHANGE EQUIPMENT, OIL TANKS, SETTLING TANKS, SEPARATORS, PIPELINES

We provide services for cleaning heat exchange equipment:

- technological pipelines from 50 to 530 mm and more.
- shell-and-tube heat exchangers;
- element (sectional) heat exchangers;
- twisted heat exchangers;
- double-tube heat exchangers;
- plate heat exchangers;
- spiral heat exchangers;
- finned heat exchangers;
- air cooling devices;
- scrubbers;
- coils on furnaces.

The technology also makes it possible to flush heat exchange equipment by the method of non-collapsible hydro chemical cleaning on the customer's territory, while saving money spent on:

- dismantling, installation of equipment;
- loading and unloading operations;
- transportation of equipment;
- disassembly, assembly of equipment.

Washing and stripping reagents of own production.

In order to minimize the impact on the metal surface and at the same time maximize the impact on deposits, reagents are selected and manufactured individually for each object.





PRODUCTION OF OILFIELD REAGENTS

- TU 0257-038-22481218-2015 — Multifunctional depressor-dispersing additive for diesel fuel and medium distillates «MONOMER-Winter».
- TU 0257-039-22481218-2015 — ASH-FREE COMPOSITE ADDITIVE TO AUTOMOTIVE GASOLINE.
- TU 0257-040-22481218-2015 — Multifunctional additive, for diesel fuel and all types of medium distillates on heavy quarry machinery, trademark «MONOMER-CHAMOMILE».
- TU 2458-043-22481218-2015 — Neutralizer of volatile mercaptans «MONOMER».
- TU 0258-046-22481218-2016 — Oil, mixed, heavy fuel.
- TU 20.41.20.190-048-22481218-2017 — Surfactants (surfactants) Trademark «MONOMER-TOPOL-Zh».
- TU 20.59.59.000-49-22481218-2017 — The anti-turbulent additive «MONOMER» is a polymer compound. Consumption 20–100 g/ton, the introduction of the additive is carried out by a plunger pump dispenser, before and during the introduction of the additive, periodic mixing is recommended.

The use of the anti-turbulent additive «MONOMER» makes it possible to reduce the cost of operating the pipeline, increase its throughput, partially reduce pressure, and reduce the hydraulic resistance of oil.

- TU 20.14.71.120-050-22481218-2017 — MONOMER adsorbents intended for collecting oil spills from solid (asphalt concrete wood soil, etc.) and liquid surfaces, for collecting petroleum products dispersed in an aqueous medium, as well as a backfill filler for cleaning by filtering substandard fuel and other petroleum products.



- TU 20.59.42.140-051-22481218-2017 — Multifunctional demulsifier for processing oil emulsions and other hydrocarbons 2500, 3200, 22-2, 2231, 2269, 2281, 2281-2, 2290-2299, 3117, 3118, 3119, 3120, 3121, 3122, 3123, 72 D, 72 B, 73, 73-1, 75 D, 75 B, intended for use as demulsifying components used for the destruction of resistant emulsions formed in the process of purification of crude oil, oil sludge and other hydrocarbon raw materials.



Multifunctional demulsifiers for processing resistant oil emulsions and other hydrocarbons of the brand «Demulsifiers» are used in the oil industry in oil refining processes at oil refineries for the purpose of dehydration and desalination of oil during its processing.

THE ADVANTAGES:

- multifunctional demulsifiers make it possible to obtain commercial oil with a very low content of a hard-to-destroy residual emulsion;
- deep dehydration and desalination of oil;
- low content of petroleum products in the supply water;
- clear phase separation boundary for fast separation;
- preventing the formation of intermediate layers;
- pressure reduction in oil collection systems;
- high efficiency at low temperatures;
- it is effective for viscous and heavy oils.

– TU 20.59.42.140-052-22481218-2017 – Additives for improving the fluidity of oil and other hydrocarbon raw materials intended for production, storage and transportation preparation «MONOMER».

Additives for improving the fluidity of oil and other hydrocarbon raw materials intended for the extraction, storage and preparation of transportation of oil, petroleum products in the oil and gas industry, grades 2117, 2118, 2119, 2119a, 2120, representing a balanced composition of fatty acid amides, ash-free polymers in a non-polar hydrocarbon solvent, intended for use as a dispersing component during the extraction, storage and preparation of the transportation of the fluidity of oil and other hydrocarbon raw materials.

– TU 20.59.43.130-053-22481218-2018 – Multicomponent anti-ice reagent «MONOMER» 5001, 5002, 5003, 5004, 5005.

– TU 20.59.59.000-054-22481218-2019 – Bactericides «MONOMER».

– TU 20.59.42.140-054-1-22481218-2019 – Hydrate formation inhibitor «MONOMER».

– TU 20.14.51.190-054-2-22481218-2019 – Salt deposition inhibitor «MONOMER».





PRODUCTION OF OIL FIELD EQUIPMENT

— TU 0257-041-22481218-2015 — Stripping air-acoustic unit, model «MONOMER-SHELF».

1. Mobile installation based on an automobile towed trailer.
2. Stationary frame installation.

— TU 8026-044-22481218-2015 — Oil collector «MONOMER».

— TU 3614-045-22481218-2015 — Acoustic resonant pulse mixer «MONOMER-SHELF».

— TU 26.51.66.190-054-3-22481218-2019 — Control station the dosing unit of the reagent «MONOMER-ORLAN-1» SKPU-1.

— TU 28.99.39.190-056-22481218-2020 — Vacuum separation unit for deep separation of fractions of light, medium, heavy hydrocarbons, model «MONOMER».

1. Mobile installation based on an automobile towed trailer.
2. Stationary frame installation.





LABORATORY RESEARCH

- Laboratory studies of oil, wide fractions of hydrocarbons for the selection of reagents.
- Determination of salts in crude oil.
- Determination of water in oil.
- Chromato-mass spectrometry.
- IR spectrometry.
- Modeling of hydrocarbon crystallization processes in their study and production of depressant additives.
- Synthesis, search for new polymeric and other materials for the production of oilfield reagents, demulsifiers, depressants, anti-turbulent additives.
- Laboratory studies of oil for the selection of reagents.



DIGITALIZATION, MODERNIZATION OF OIL FIELDS — REMOTE CONTROL STATIONS



The Control Station «ORLAN-1» is designed to control the pumping unit for dosing reagent into the main pipeline. The control is performed by adjusting the speed of the electric motor in accordance with the flow meter readings. The speed setting is performed both manually by the station operator and in the automatic mode of maintaining the required flow rate. The software in the station provides a remote control interface with the ability to archive work data.

The main functionality of the Control Station «ORLAN-1» produced by LLC «NPK «MONOMER»:

1. It is intended for connection to already existing reagent supply units, where the injected volume is accounted for by calculation, according to the measuring glass and the capacity calibration table.

2. The purpose of retrofitting these reagent supply units with these stations is to eliminate the human factor when pumping the required volume of reagent, high-quality measurement, remote control.

3. Working functionality:

- the use of a gear flow meter, which allows for high-quality measurement of the reagent flow rate at the required minimum flow rate (flow meters are selected for the required flow rate from 0.5 to 80 liters/hour at a pressure of up to 100 atm);

- this flow meter can operate with a pulsating supply from a plunger pump with a minimum error of up to 1%.

Remotely on the ARM (automated workplace) in the program interface, you can:

- start, stop the pump operation;
- set the required pump flow rate in manual and automatic mode;

- see in real time instant consumption, consumption for 2 hours, cumulative consumption, consumption for the last 24 hours;

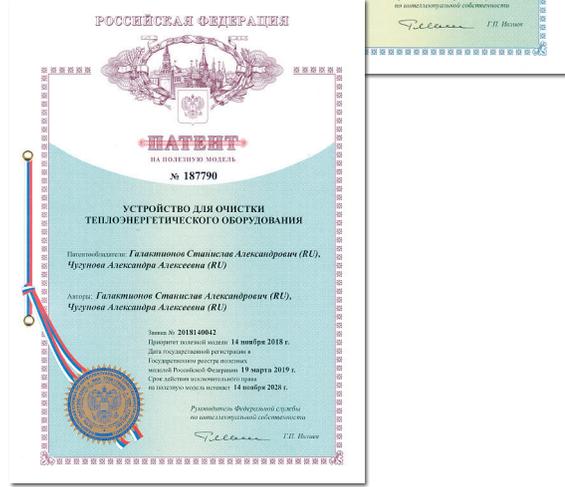
- see the operation parameters of the frequency converter (frequency, current, temperature, operating status (operation, stop, manual and remote control mode)

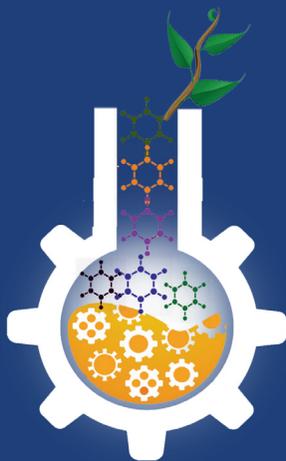
- it is possible to view graphs (trends) for all controlled parameters from the moment the station is started. Identify discrepancies from actual and ostentatious reporting information;

- data transmission from the control station over the GSM network goes to the server where a special program is installed, and then this program is controlled from the automated control system by a specially appointed specialist. In our case, this is the shift supervisor of the Central Oil Preparation Point (CPPN);

- the control station is equipped with a frequency converter, a controller, a router with a GSM SIM card and equipment for ventilation and heating.







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