

# DYNAMICS Scientific Production Center USA, Inc.

**Our Mission is to research, develop and promote across the world the Technology of Safe Resource-Saving Operation and Maintenance of Machinery of hazardous industries by creating real-time monitoring systems for the automatic diagnostics of machinery at industrial sites to prevent any malfunctions, failures or breakages and to reduce the risk of accidents, fires and downtimes during any machinery's life cycle.**

Welcome to the official website [www.usadynamics.com](http://www.usadynamics.com) of DYNAMICS Scientific Production Center USA, Inc. – a Texas corporation with headquarters in Houston.

We are a subsidiary of Scientific and Production Center "Diagnostics, Reliability of Machines and Complex Automation" - NPC DINAMICA.



NPC DINAMICA was founded in 1991 by Vladimir N. Kostyukov in Omsk, Russia for the purpose of resolving one of the most critical challenges of oil-refineries – the frequent, unforeseen and sudden breakdowns of machines.

The COMPACS Systems monitor almost all the machinery of the most valuable refinery units, generate real time diagnostic prescriptions to prevent particular malfunctions and defects in machines, and provide the extremely high probability of automatic diagnostics.

The COMPACS System was designed in 1991 and has been improved since in terms of increasing the number of detected defects, diagnostics depth at an early stage of machine degradation, etc.

Over 680 COMPACS Systems at dozens of enterprises in Russia and CIS countries in 12 industries monitor over 25,000 machines of more than 2,430 types of various equipment, including compressors (centrifugal, screw, piston), pumps (console, double-seat, vertical, hermetic, etc.), motors (up to 6 MW), gearboxes, turbines, air-coolers, cooler towers, etc.

In accordance with our mission the Technology of Safe Resource-Saving Operation and Maintenance of Machinery was developed in 1997 and has been improved since as well. Implementation of the Technology eliminates accidents and breakdowns, extends the machinery's uptime and decreases a facility's downtime and maintenance costs significantly.



*801 Travis, Suite 2025, Houston, Texas*

Our Systems and Technology have changed refining in Russia and CIS countries by dramatically decreasing operational risk and increasing the safety and operational efficiency of processing in the refining industry.

We are working hard to achieve this goal globally!

We perform the whole set of system's implementation works on a turnkey basis. Our engineers carry out design and survey works on the customer's site, design, install and commission systems. We also train the customer staff to operate the systems. After implementation we provide warranty and post-warranty maintenance and other brand-support services.

## Make the Future Visible



# Scientific Production Center “Diagnostics, Machinery Reliability and Complex Automation”- NPC DINAMICA

We are a developer, manufacturer and supplier of the COMPACS stationary, portable and bench instruments and systems for vibration analysis, computer monitoring and automatic diagnostics of equipment combined into the COMPACS-Net integrated diagnostic network, which constitute the COMPACS Automated Control System Safe-Money-Saving Real-Time Maintenance™ (ACS SMSRTM™).

The systems realize all the main non-destructive testing (NDT) methods, including vibration analysis, acoustic emission, electrical, optical, eddy current, thermal, ultrasonic, acoustic and other NDT methods. This allows on a common hardware and software platform to automatically diagnose and monitor technical state of various equipment, such as:

- dynamic equipment (machinery, rotary) - pumps, centrifugal and piston compressors, electric motors, reduction gearboxes, multipliers, fans, centrifuges, gears - over 2,430 types of other rotating machinery;
- static equipment (column-capacitive) - columns, tanks, reactors, pipelines, receivers, heat exchangers, ovens.

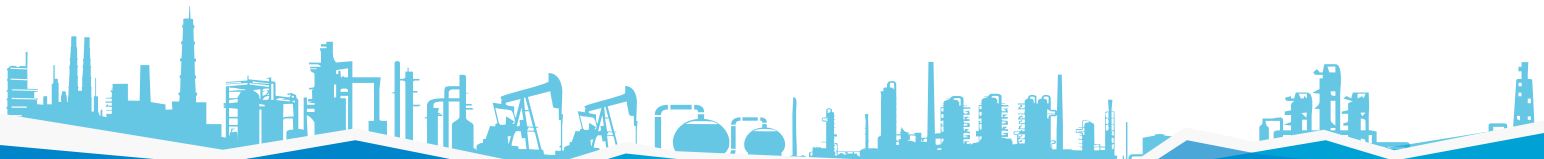
We carry out works on the systems implementation on a "turnkey" basis, namely, design and survey works, design development, industrial safety expertise of design documentation and equipment. The company employees perform construction and installation, wiring and commissioning works, the Customer's personnel training and certification in the COMPACS System operation, the systems warranty and post-warranty service.



108 Rabinovicha St., Omsk, Russia

Doctors and PhD in Technical Sciences work in our company, many specialists are certified to Level II and Level III in different NDT methods, which allows us to carry out industrial safety examination of hazardous production facilities, to train and certify the Customer personnel in such NDT methods as vibration, acoustic emission and others in our Training Center accredited and certified in accordance with the existing state standards.

We survey enterprises, develop a feasibility study and a program of the equipment operation on its actual technical state in real time in order to improve industrial safety, effectiveness and efficiency of its production facilities. According to the developed program, the system of schedule-based preventive repair is optimized, run-to-repair and run-to-failure of the equipment and the whole production operation increase.



## The Company offers an all-in-one service and work package on implementation of the COMPACS vibration-based condition monitoring system at the Customer's plants

We perform the full range of works on implementation of our products at the Customer's plants. Our personnel carry out survey and design works at the Customer's processing facilities, develop design documentation for the supplied products, supervise the installation and wiring works, perform commissioning and acceptance testing, train the Customer's representatives in operation of the implemented products, provide warranty and post-warranty maintenance.

The first vibration monitoring system (SVK-1) was implemented at Omsk Refinery in October 1990, and since that time we are constantly improving our systems and expanding the range of our customers.

Currently over 100 companies throughout Russia and other countries in and outside the CIS successfully operate our products at hundreds of production facilities. The systems diagnose more than 23,400 domestic and foreign machines and units of over 2,430 types.

**Reliability of products supplied by DINAMICA has been proved by more than 26 years of their operation at customers' facilities. Mean Time Between Failures (MTBF):**

- sensors - 1,600,000 h.
- modules - 510,000 h.
- controllers – 72,000 h.

**Our condition monitoring systems allow:**

### **1. For processing facilities to:**

- monitor the machinery condition;
- increase stability of the process by preventing accidents, production malfunctions and downtimes;
- reduce operational expenses by preserving the machinery maintainability during the whole service life, and eliminating unreasonable and low-quality repairs;



- save materials, components and spare parts;
- replace overhauls and medium-scale repairs with maintenance;
- provide input and output control and automatic diagnostics of equipment after repair and installation;

### **2. For repair shops to:**

- increase the repair quality by dint of the equipment bringing to the demanded quality rating and reduction of decommissioned equipment and repeated assembling and dismantling and transportation works;

### **3. For company overall to:**

- increase the personnel controllability;
- reduce scopes and terms of overhauls on the





basis of profound diagnostics and benchmarking;

- optimize the equipment base for the purpose of minimization of energy consumption and production losses;
- eliminate design errors and speed up commissioning of new assets.

We have developed a number of generic solutions for ensuring safe money-saving operation of machinery and processing equipment, which allows to operate the equipment and carry out schedule-based preventive repair according to the actual technical state.

In various industries a large amount of machinery and mechanisms are controlled by the COMPACS condition monitoring system: pumps, centrifugal, piston and screw compressors, reduction gears, multipliers, electric motors, steam turbines, mixers, reactors, refrigerators, steam generators and hydraulic turbine generators, dryers, rolling mills, exhausters, machining facilities, air cooling units, suction-and-exhaust ventilation, columns, separators, tanks, pipelines, gate valves of pipelines, wheel motor units of electric trains, locomotives and electric locomotives, electrical sections and electric multiple units as a whole.

## Design of the COMPACS Vibration-based Condition Monitoring System

While engineering new products, we use the latest hardware and software, which considerably reduces the time for product development, increases the product quality and reduces time for preproduction. All design documentation is prepared according to the applicable standards.

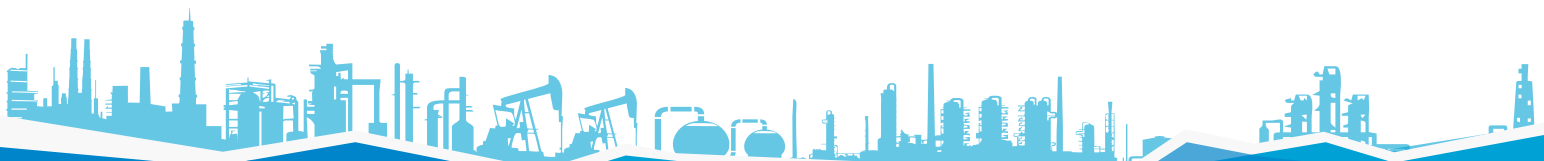
We have a Design Documentation Development Department, which allows us to develop projects of any extent and complexity within the shortest time.

All the department specialists are certified for knowledge of the industrial safety requirements established in the federal laws and regulations, which allows to develop design documentation for equipping hazardous production facilities with the COMPACS monitoring systems and obtain a positive industrial safety expert review.

The design documentation for the COMPACS computer monitoring system of accidents prevention and machinery health control includes:



1. Explanatory note;
2. General data;
3. Specification;
4. List of diagnosed equipment;
5. Installation charts for sensors;
6. Electric block diagram;
7. Electric schematic diagram;
8. External wiring netlist;
9. Hook-up diagram for equipment and wiring;
10. Location plans for equipment and wiring;
11. Attached documents.



# Manufacturing of the COMPACS Vibration-based Condition Monitoring and Diagnostic System

To manufacture products that meet the needs and expectations of customers, we have production facilities equipped with the most advanced equipment. We have a unique set of high-precision vibration-measuring instruments used in testing of all systems produced.

The quality of our products and services is confirmed by necessary certificates, permits and licenses.

Since 1993 all our products have been undergoing obligatory periodic certification under the requirements of the Federal Service for Ecological, Technological and Nuclear Supervision for the use at its regulated plants and facilities.

Thus, the COMPACS and the COMPACS-micro systems for equipment vibration analysis, as well as the 8001vibration calibrator are permitted to be used for many years of their production and operation. Moreover, these systems have certificates of conformance with the explosion proof equipment standards.

All the systems we manufacture are measuring devices. They are listed in the Russian Federation State Register of Measuring Devices and have the type approval certificate for measuring devices.

Totally we have over 40 permits, which are constantly kept up to date in accordance with the Russian Federation laws.



## Installation and Commissioning

We perform supervision of installation, wiring and commissioning works. Construction and installation works on laying of ducts, pipes protection and local cable lines, mounting of boxes and sensors holders at the monitoring objects are performed under the company experts' supervision and according to the developed design documentation.

Our specialists fulfill mounting of the diagnostic

stations equipment, field modules and sensors, perform an autonomous and comprehensive commissioning of the system. Upon the commissioning, they together with the Customer's specialists carry out acceptance tests of the fully assembled and functioning COMPACS condition monitoring system and then place it in commercial operation.



For the products successful implementation, a series of instructions and technical documentation has been developed, the specialists have their own tooling and a well-proven technology, which allows them to assemble and commission the products from the first presentation to the Customer.

At the final stage of implementation, during acceptance testing, we train the Customer's specialists in the operation of the vibration monitoring systems and equipment under their control.



## Warranty and Postwarranty Service of the COMPACS System

After the products implemented we provide warranty service within the time established in the technical documentation, or specified separately.

Regardless of the service type, we provide free advice on how to use our products in various operating conditions and operate the diagnosed equipment by any means of communication and in direct contact with the Customers.

Our experts have developed techniques and equipment used to verify and calibrate the COMPACS vibration monitoring system™ on-site and without dismantling.

The 8003 universal calibrator and 8001 vibration calibrator were designed and manufactured for in-place system verification and calibration. These instruments are listed in the Russian Federation State Register of Measuring Devices and have the type approval certificate for measuring devices, and the 8001 vibration calibrator has a certificate of compliance with the standards for the explosion-proof electrical equipment and is suitable for hazardous environments.

Our Metrological Service is accredited by the Federal Agency for Technical Regulation and Metrology to verify and calibrate measuring instruments, and is made up of certified calibration technicians.



8003 Universal calibrator



8001 Vibration calibrators

# We make the future clear, certain, predictable and safe!

