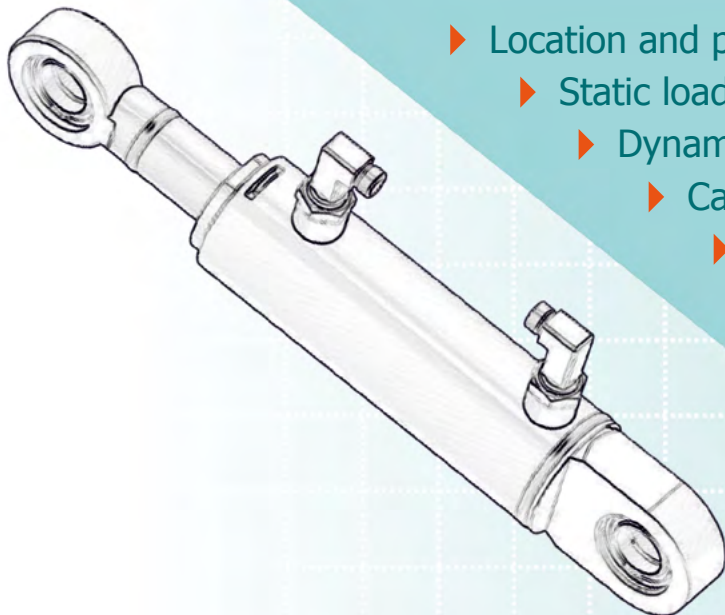




From Idea to Implementation



Test Automation



- ▶ Location and position control
 - ▶ Static loading
 - ▶ Dynamic and endurance tests
 - ▶ Calibration of force measuring systems
 - ▶ Transportation tests
 - ▶ Temperature and strength tests
 - ▶ Modeling of behavior
 - ▶ Turning tables



About us

Research and Production Enterprise, founded in 1992, are specialized in the design, manufacture and supply of control systems for various applications, oriented on the specific customer requirements. MERA is a leader in the development of «turnkey» modern high-tech systems.



Mission

To provide the Russian enterprises for high-quality measurement and control systems, complying with the world standards; actively promote to technological development and prosperity of the country.



Our goal

To become the world's leading developer and supplier of measurement and control systems that meets the highest current and future-oriented requirements of industry.



- Licenses and certificates Federal Security Service of Russia, ROSTEST et al.
- Guarantee period – 3 years.

Our concept

- Integral approach to the automation of bench tests – from detailed elaboration of technical specifications to delivery of ready-for-service «turnkey» equipment, training of customer’s specialists and technical support.
- Most advanced hardware and software solutions, highly-integrated reliable element base, modern technologies of production and assembly.
- All apparatus of supplied system runs under a single software developed by MERA. All system interfaces are customized, providing opportunities for quick setup and efficient organization of test process.



We propose

Control systems for hydraulic and electromechanical force actuators with integrated systems of strain-gage testing and motion control:

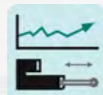
- Location and position control
- Static loading
- Dynamic and endurance tests
- Transportation tests
- Thermal and strength tests
- Modeling of behavior
- Calibration of force measuring systems
- Rotary stands (centrifuges).

Intended use

Control and measuring systems based on mobile test units (MICs) and on-the fly controllers perform:



- Simultaneous formation of variable load for each of the loading channel;



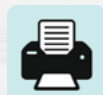
- Reproduction of load changes using servo hydroelectric drives or electric jacks;



- Monitoring of loading/emergency unloading in case of exceeds a predetermined load value;



- Registration of deformations and displacements of the test object;



- Calculation of strain-gage rosettes, preparation of reports.

Features

- Performing the tests in automated and automatic modes according to a predetermined cyclogram.
- Graphical display of measurement data and a visual display of test progress test by video surveillance subsystem.
- Registration and storage of the measurement results and video data in the database of test data.



Certification

- Introducing the metering systems into State Register of measurement equipment.
- All supplied measurement equipment in the systems introduce in the State Register of measurement equipment.



1
Elaboration of the technical specification meeting the customer' engineering requirements. Development of the working design documentation.

2
Development and manufacture of equipment, testing of system components on steadiness to external effects. Primary metrological check. Development of operational documentation.

3
Development of specialized software.

4
Design and manufacture of cross-boxes, signal conditioners. System complement by sensors.

5
Carrying of the pre-commissioning activities. Complex debugging of measurement systems.

6
Technical support, training the customer's staff. Metrological support.

7
Maintenance service, modernization.



Automated control systems for "turnkey" static and re-static tests



- 1** Measurement and data acquisition systems
- 2** Systems of loading control
- 3** Electrical and hydraulic cylinders
- 4** Strain gauge sensors, linear displacement sensors, sensors of crack development
- 5** Specialized software

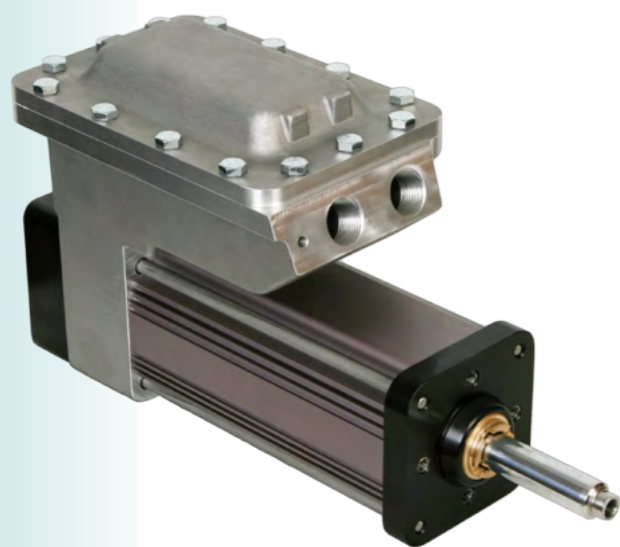
The force actuators

The hydraulic equipment for dynamic and static tests

- Rod stroke – up to 6 m
- Force – up to 9000 kN
- Pressure – up to 40 MPa (400 kgf/cm²)
- Frequency – up to 500 Hz



The hydrostatic electric cylinders for testing



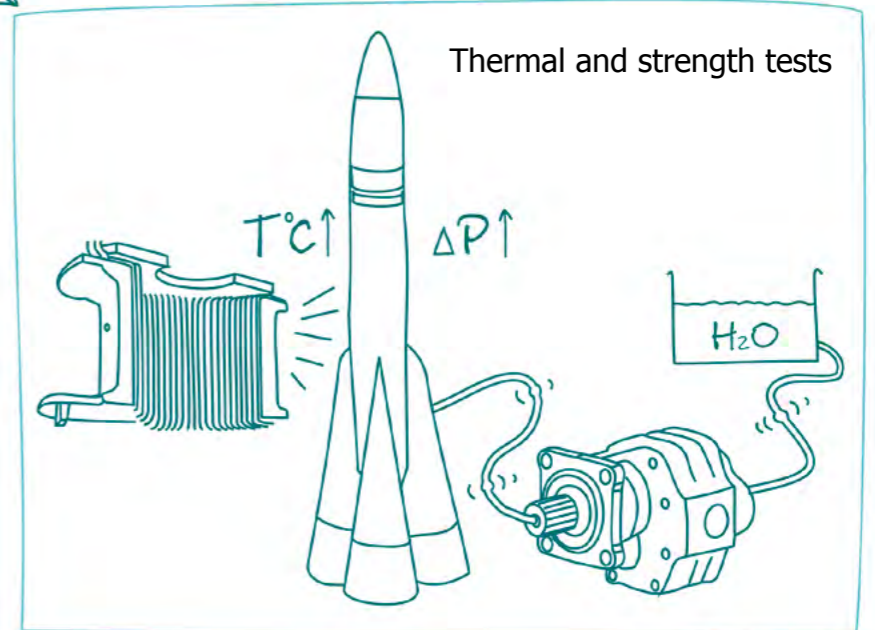
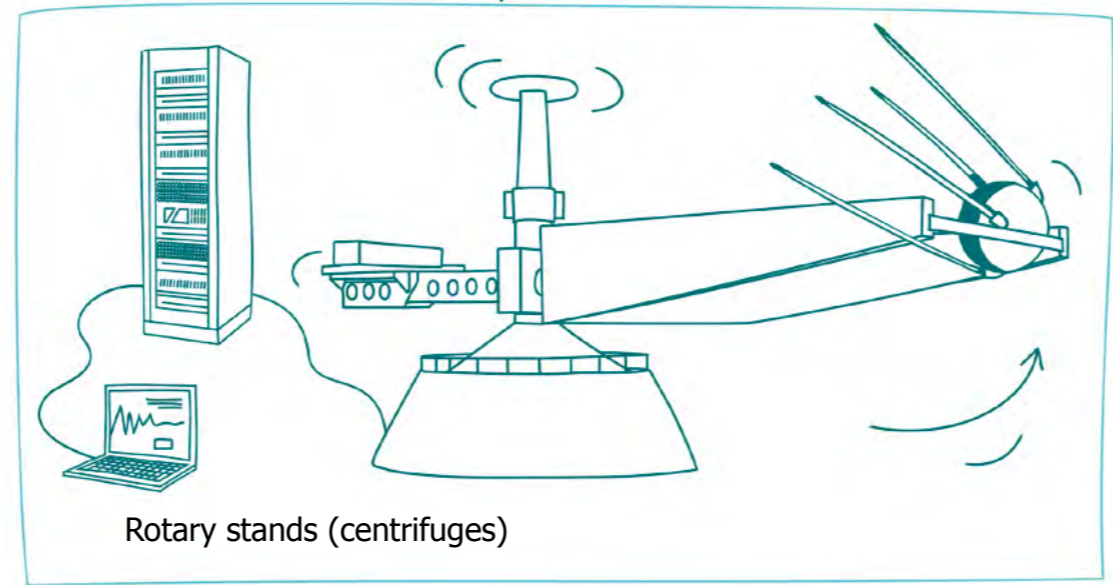
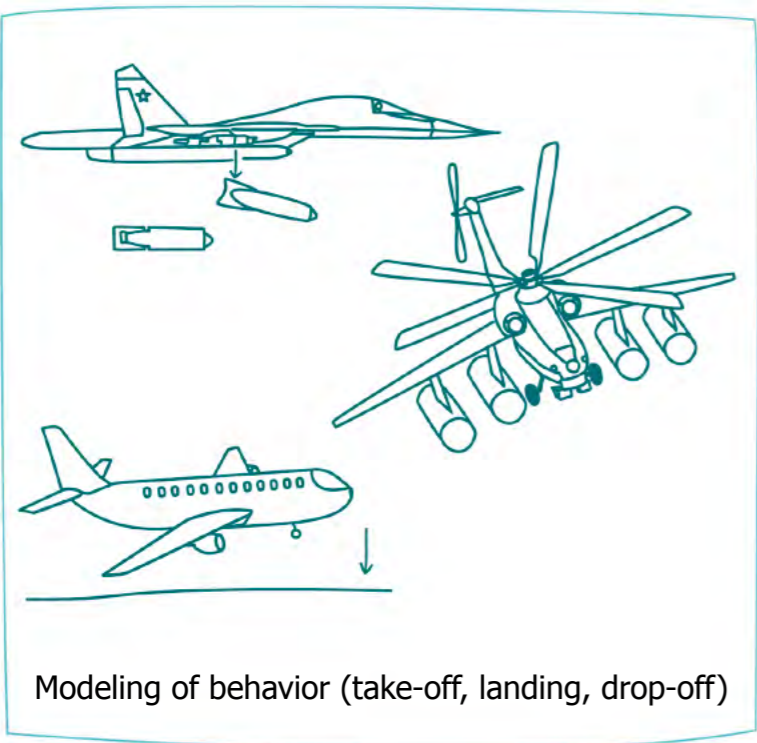
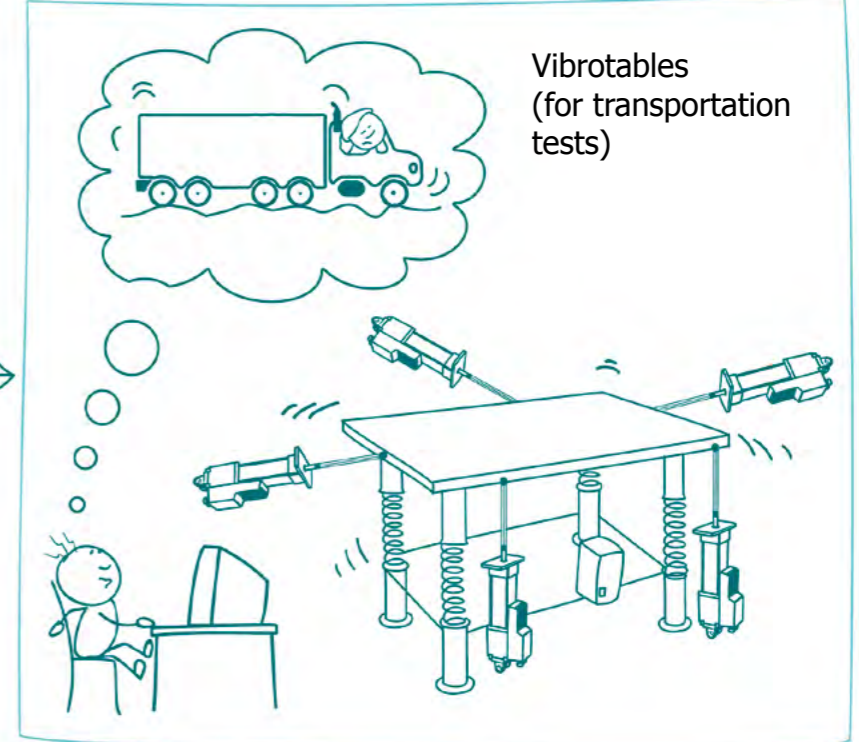
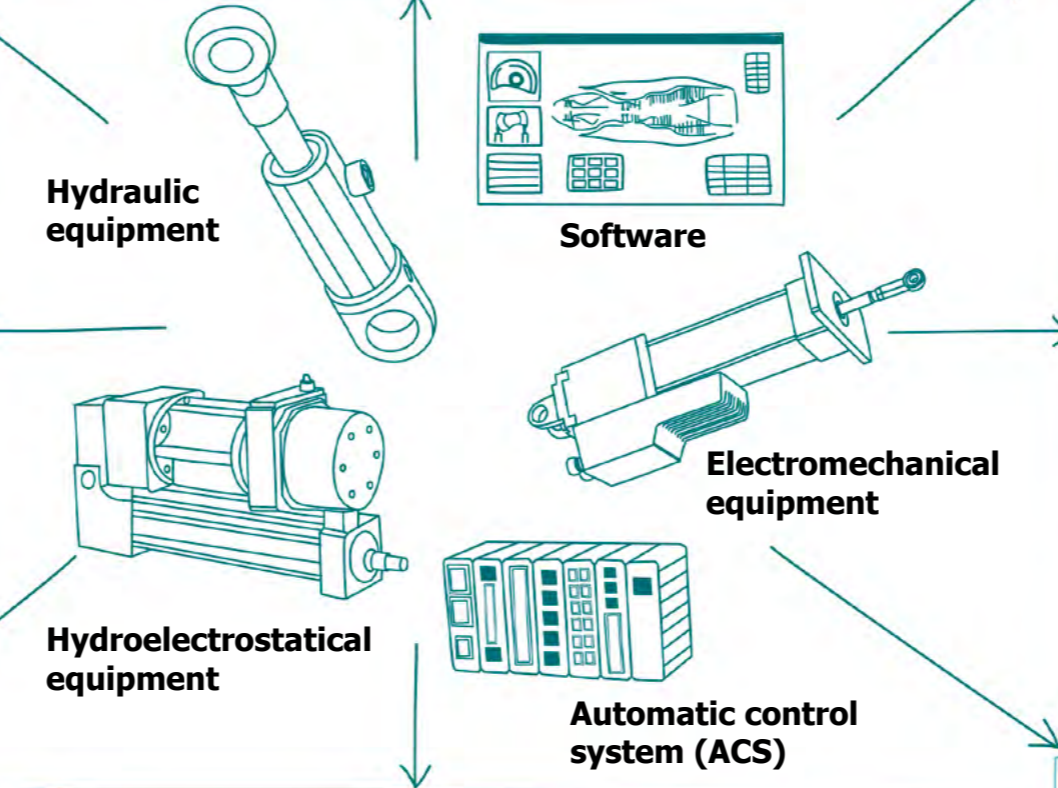
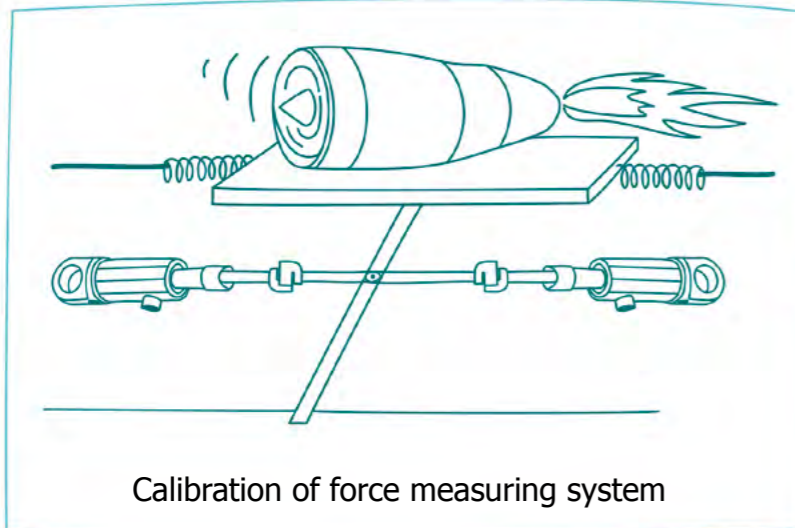
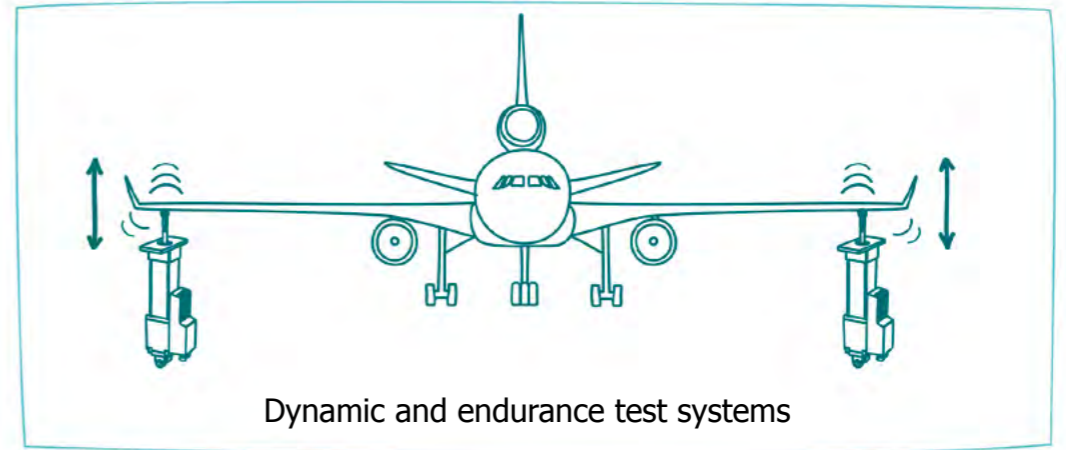
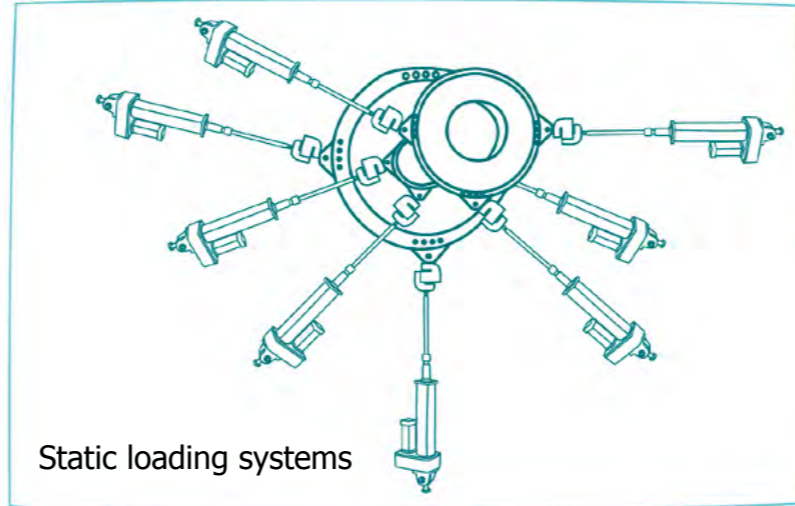
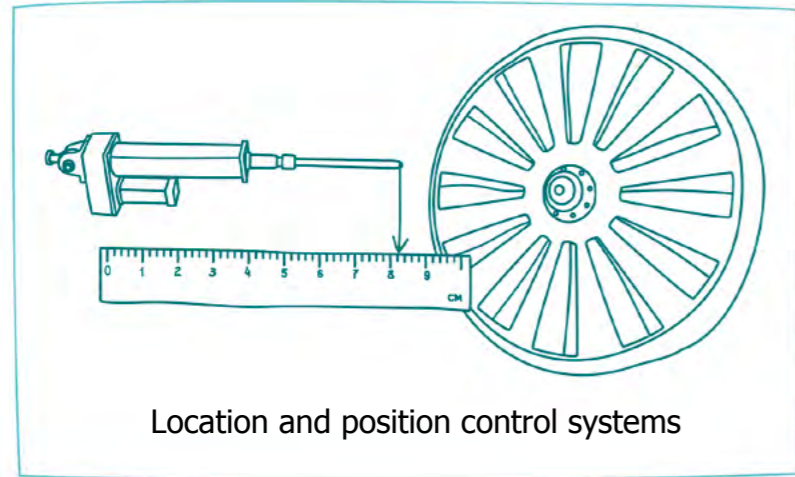
- Rod stroke – up to 8,5 m
- Force – up to 1600 kN
- Accuracy of positioning – 1 μm
- Operating temperature range – from -60 to $+90^\circ\text{C}$
- Frequency – up to 5 Hz

The hydraulic loading system (without oil system)

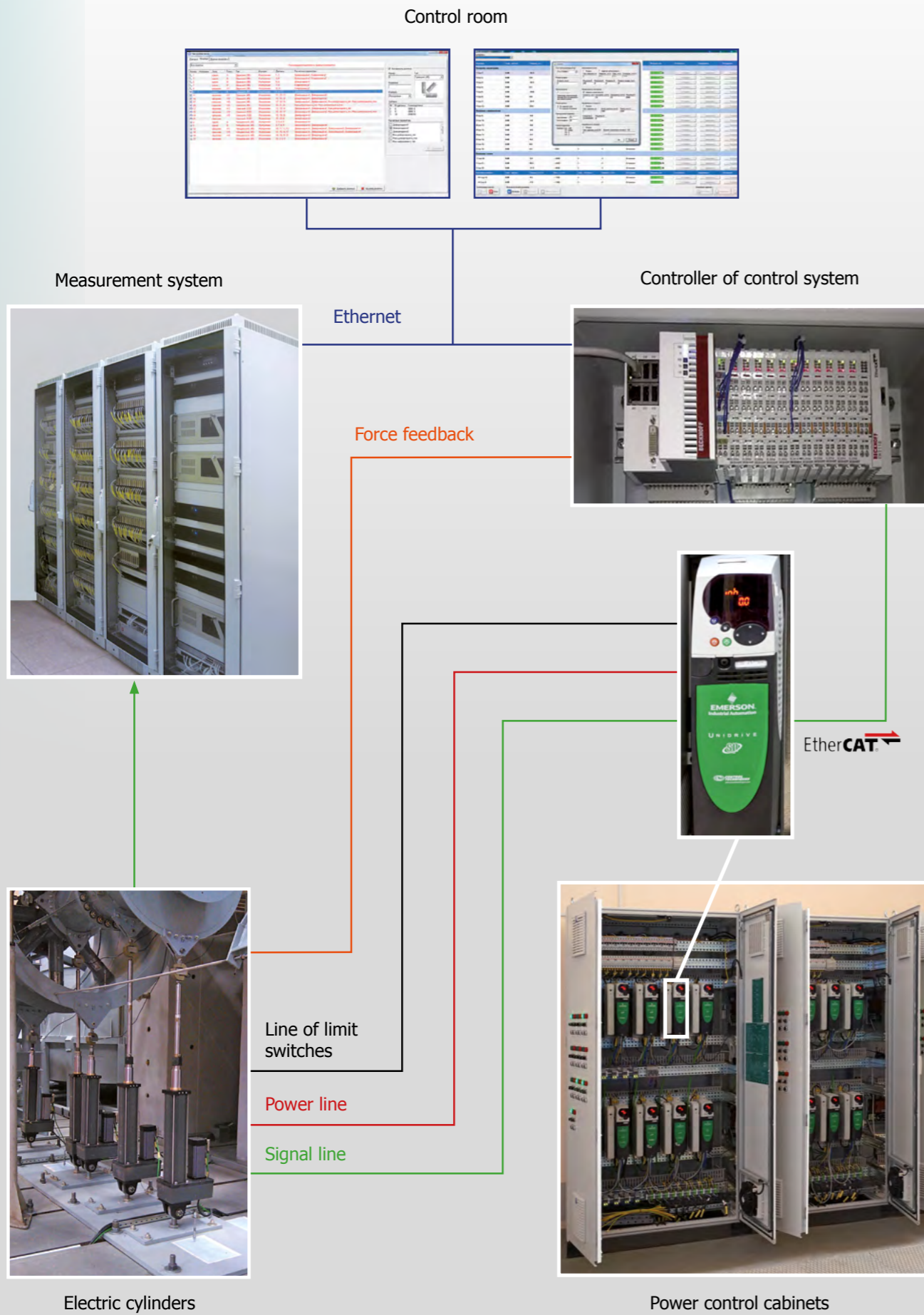
The hydrostatic electric cylinders

- Perfect solution for highly responsible mechanisms
- Hydraulic infrastructure is lacking
- Accuracy of maintenance the forces without external sensors – 0.5%
- High positioning accuracy – 2 μm
- Frequency – up to 0.5 Hz
- Force – up to 2000 kN
- Maintenance – not more frequently than 1 time in 10 years
- Linear velocity – from 2 $\mu\text{m/s}$ to 1000 mm/s
- Protection class – P67
- Double sealing system with wear protection
- Maximum power – 6.0 kW
- Low power consumption
- Rod stroke – up to 1000 mm





Loading system

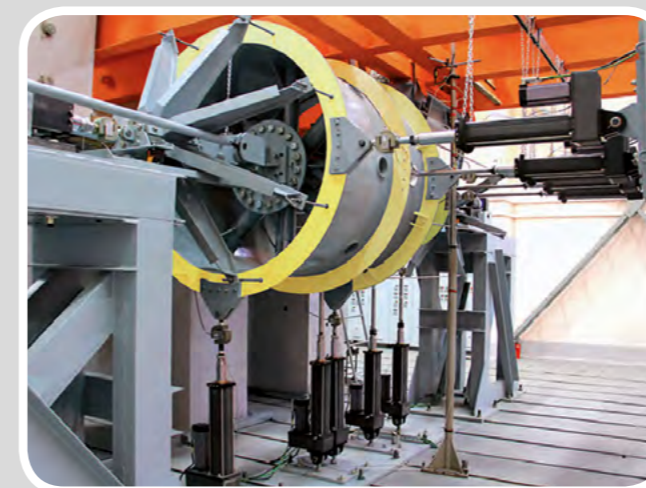


The emergency protection system

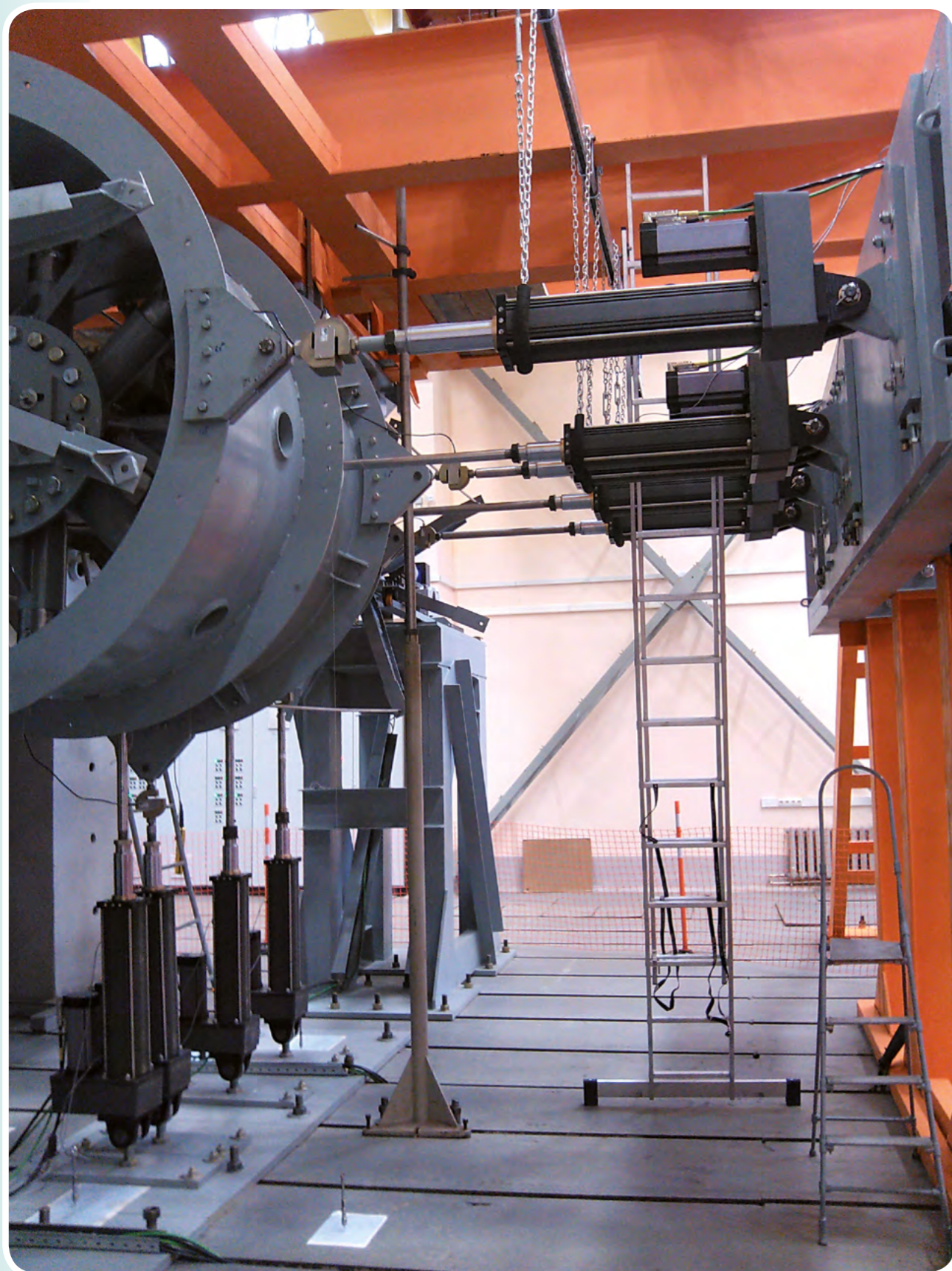
- Algorithms to prevent the force and movement induced damages
- Cyclograms of load shedding
- Check of equipment integrity



Operator workplaces



Remote panel



Loading system



Racks of measurement system



Control room



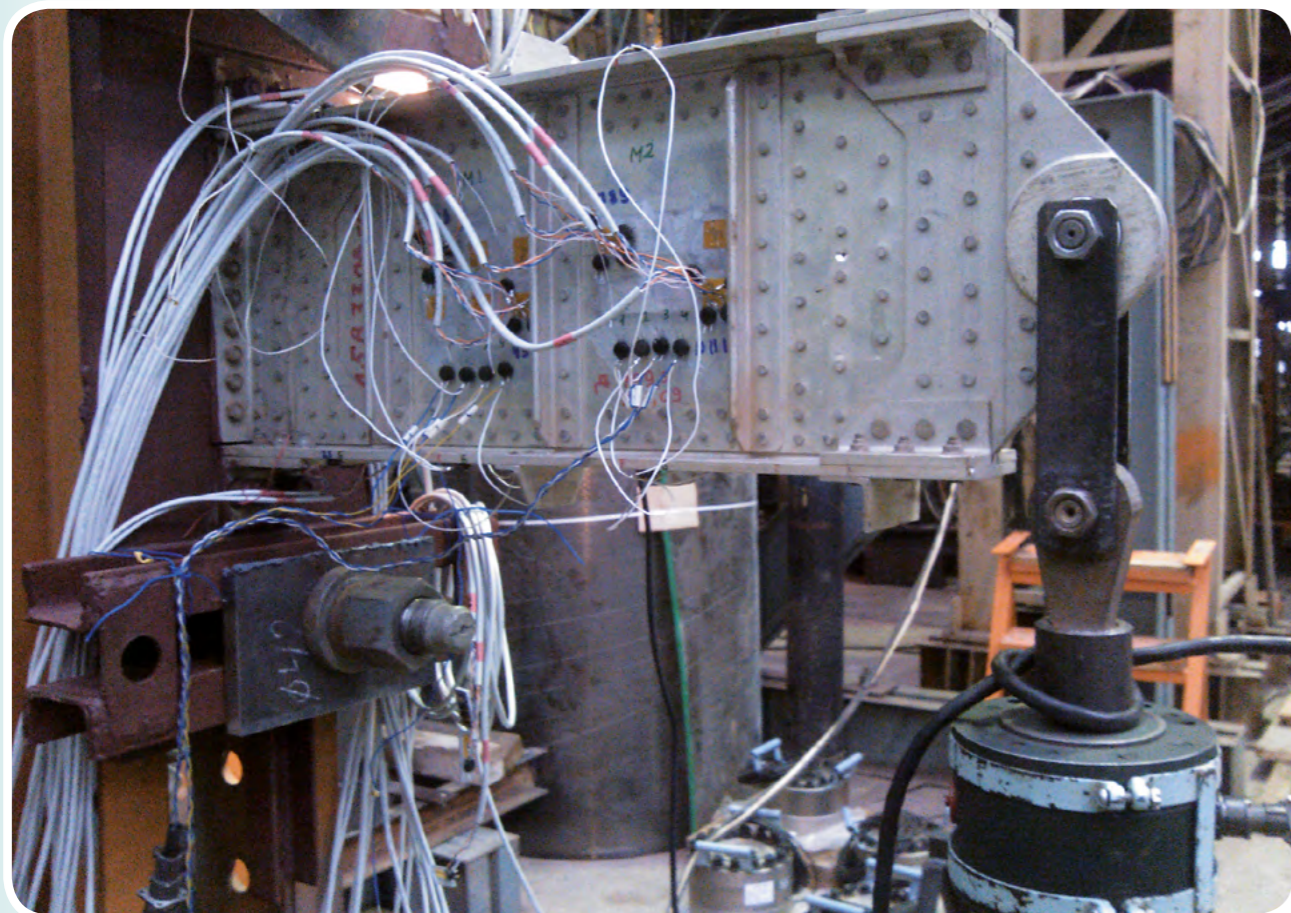
Power control cabinets



Power control cabinets



Electromechanical force actuators of loading system



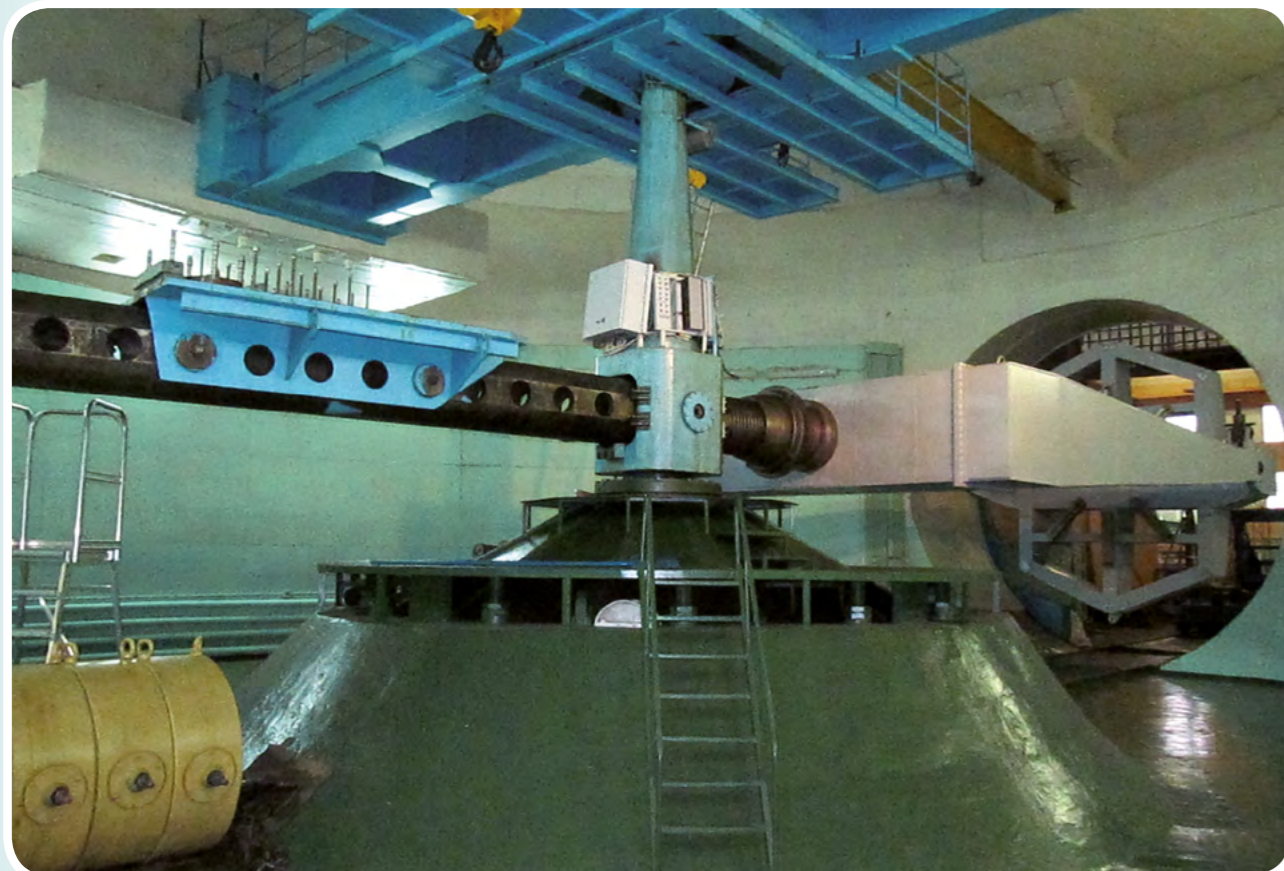
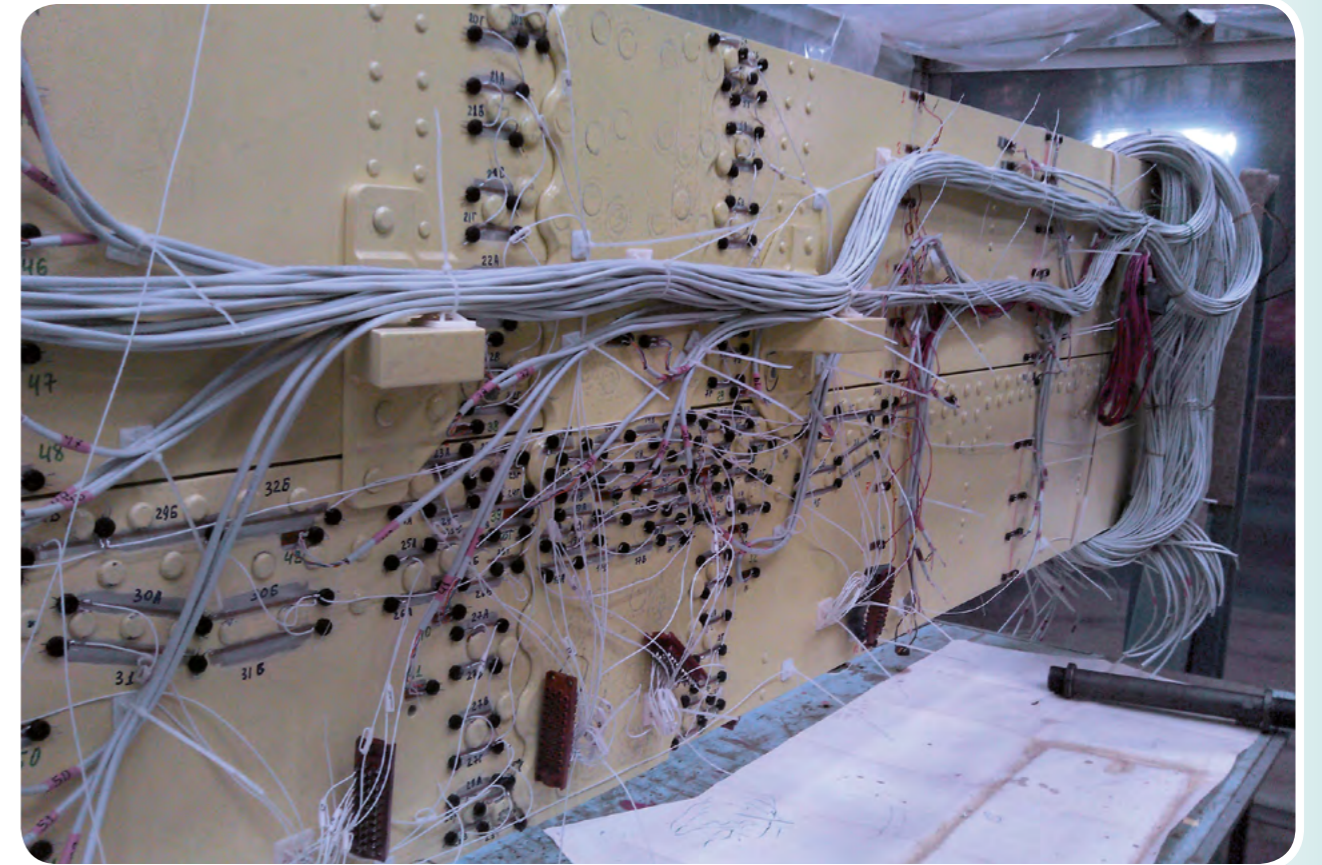
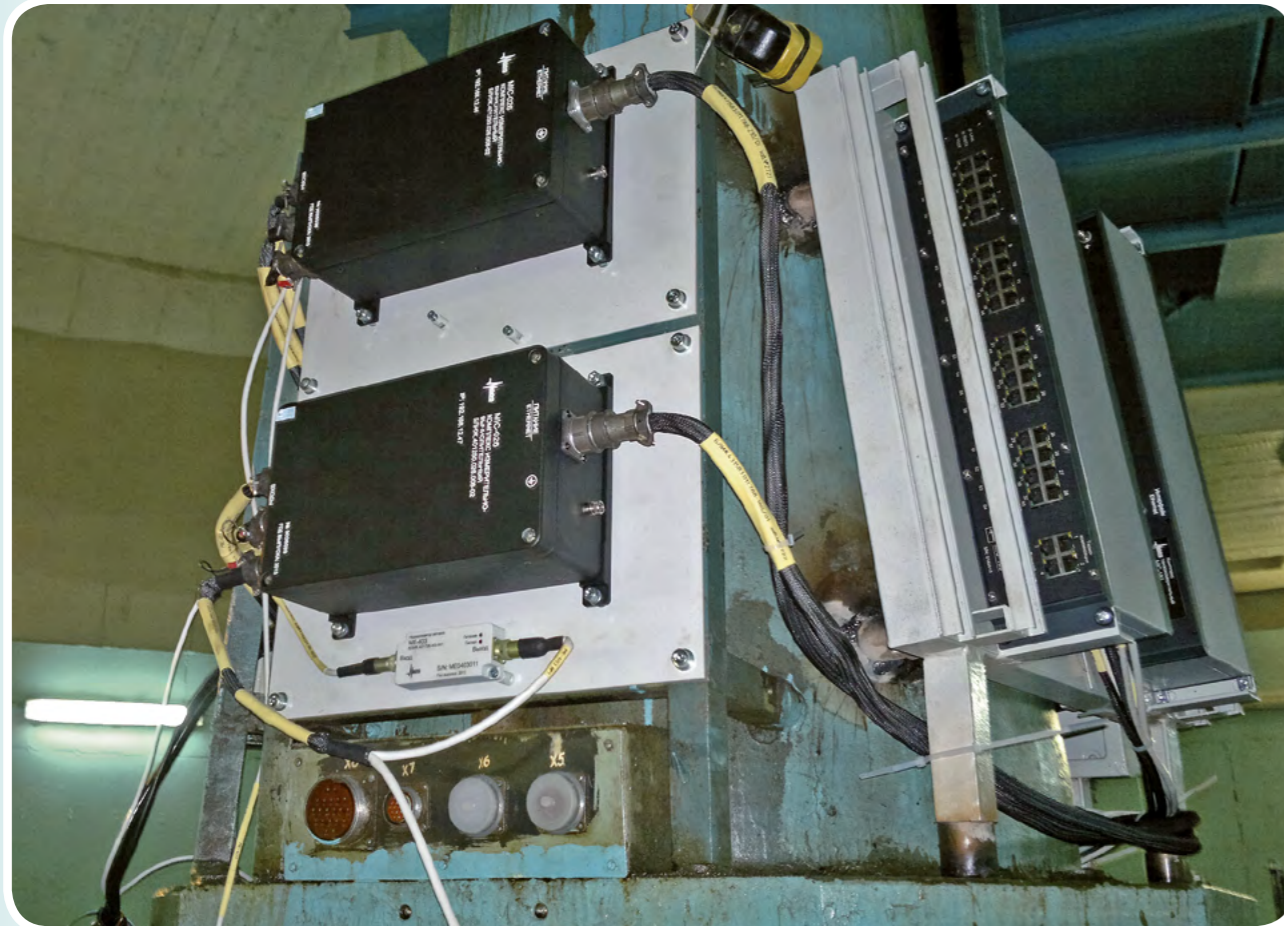
Debugging of the loading and measurement system



Control system for rotation platform of test-bench

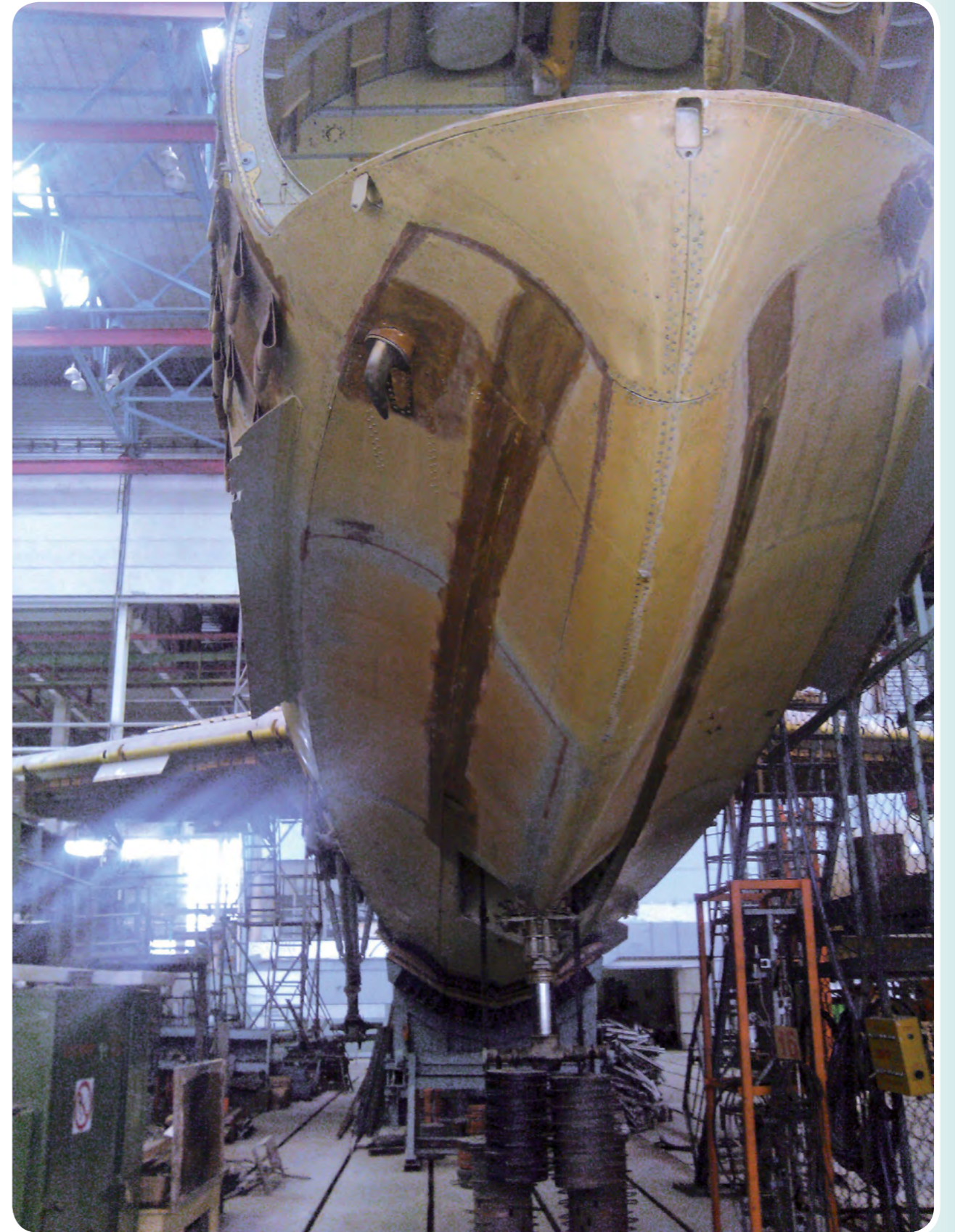


Control system for rotation platform of test-bench



Recording and data processing system in the centrifuge tests

Strength tests of large structures



Site of static tests

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