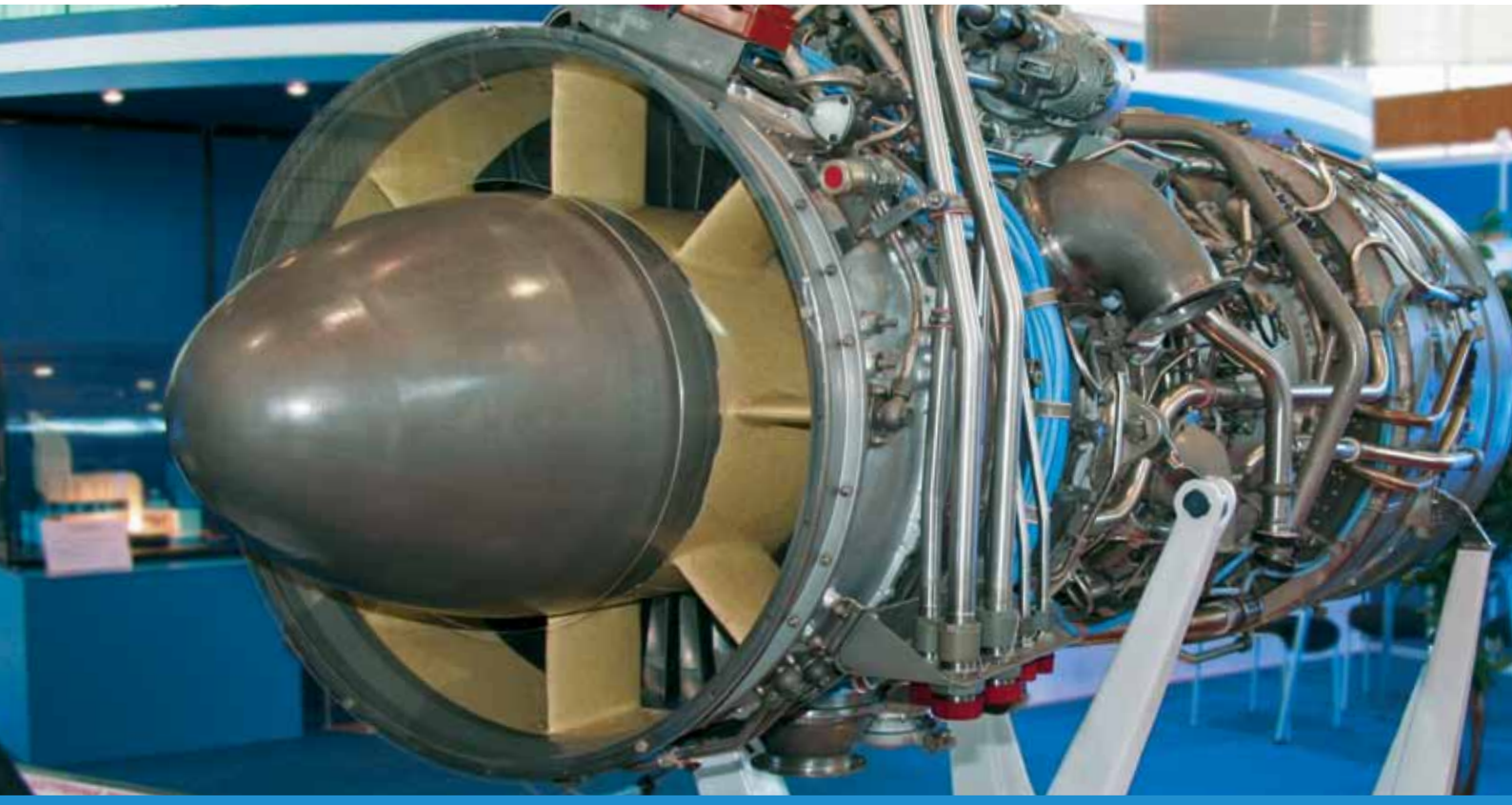
DYNAMICS R4
Program System for Turbomachinery Rotordynamics Analysis

TRANZIT



DYNAMICS R4 – the software package is specifically developed for design, analysis and trouble shooting of many kinds of rotating machinery. The objects of research – gas-turbine engines, power plants, air compressors, starters, turbo-expanders, turbo-driven pump assemblies, any kinds of gear systems, etc. It can be also used for development of model based diagnostic algorithms.

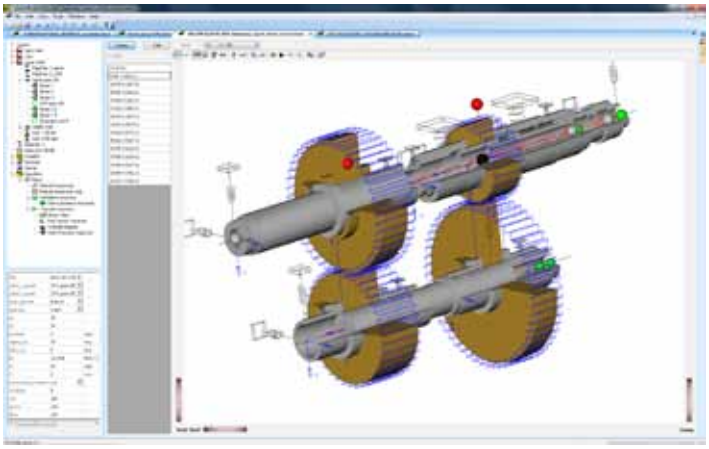
TRANZIT

General Properties

- Variety of practical rotor dynamic problems of rotating machinery those can be solved in Dynamics R4
- Analysis of linear and non-linear rotating structures
- High accuracy and speed of computations
- Adaptive methods of numerical integration in transient analysis
- Modular architecture of program system that allows its developing and perfecting.
- Possibility of user's algorithms and elements development and integration them into software
- Advanced system of information, including help functions and warnings and error messages
- More than 40 examples of models and solutions those demonstrate program functionalities including from published papers, manuals, and textbooks
- Support of students end engineers in their learning to rotor dynamics backgrounds
- A user-friendly Russian and English interface

Functional Capacity

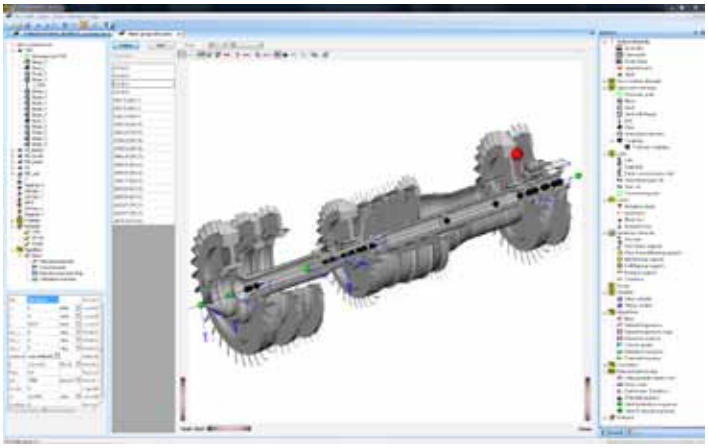
- Modeling of multi-shaft and multi-level rotor structures including cases, mountings and foundation
- 3-dimensional location of subsystems (free orientation of spin axes) - coaxial or crossing
- Parametric analysis – time variation of speed, geometry, stiffness and damping coefficients, loads, etc
- Numerous stationary and non-stationary external loads



- Super-element approach in modeling of rotor structures
- Modeling and analysis of gears used in rotating machinery

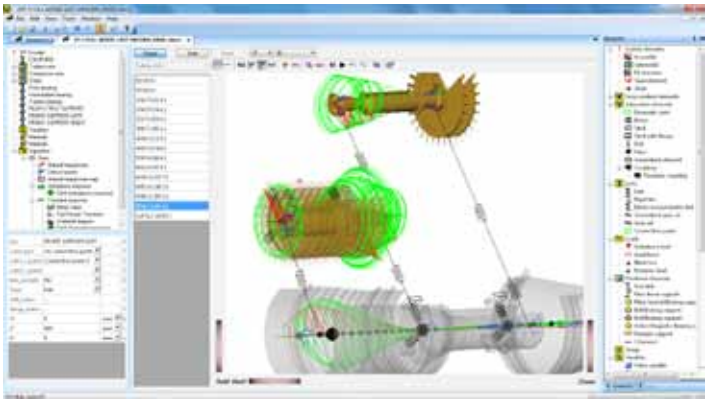
Loadings

- Multiple static and unbalance forces
- Gravitational forces and imposed overall acceleration
- Dynamic forces of general kind
- Impulsive and impact forces
- Blade loss
- Harmonic excitation
- Ground motion
- Alford and Wachel forces



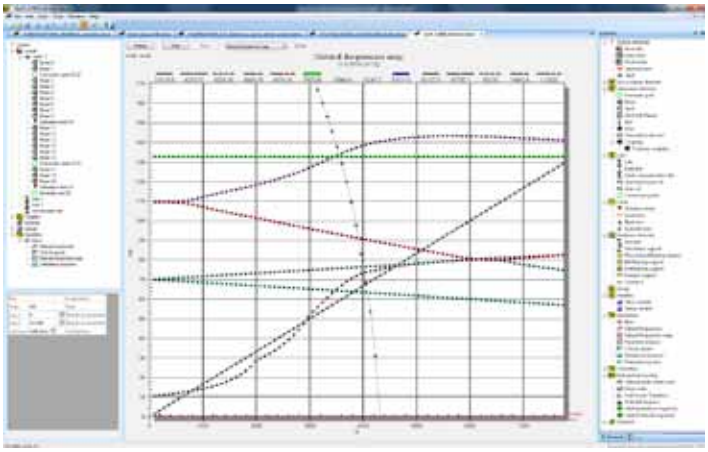
General Problems of Linear Dynamics

- Damped natural frequencies and mode shapes of rotor systems
- Natural frequencies and stability maps
- Kinetic and potential energy distribution through rotor model elements for any mode shape
- Critical speeds
- Unbalance response
- Computation of rotor systems with time depended stiffness and damping matrixes coefficients
- Parametric maps

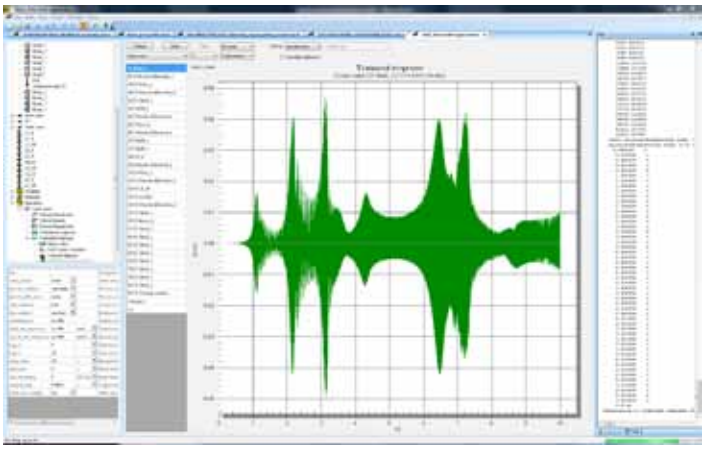


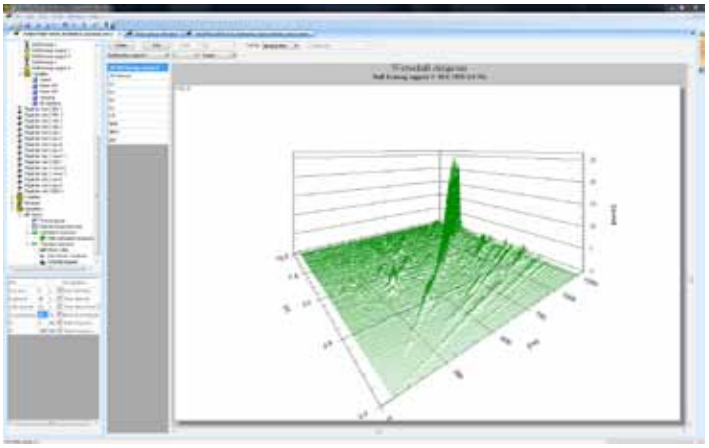
General Problems of Transient and Non-linear Dynamics

- Transient response due to acceleration and deceleration of rotor system
- Transient response of rotating structures due to various of non-stationary loads
- Modeling of rotor structures with nonlinear supports and seals of general kind
- Clearances and rubbings
- Computation of rotor systems with journal bearings
- Modeling and analysis of rotor systems supported on rolling bearings
- Stability thresholds computation
- Magnetic supports



- Computation of rotor systems with squeeze-film dampers
- Computation of complex rotor systems including various user's links





Services

- Engineers training in rotordynamics.
- Technical consulting in rotordynamics
- Design of rotor-bearing structures
- Dynamical analysis of rotor-bearing structures
- Design of the non-standard and unique experimental equipment for rotor-bearing structures

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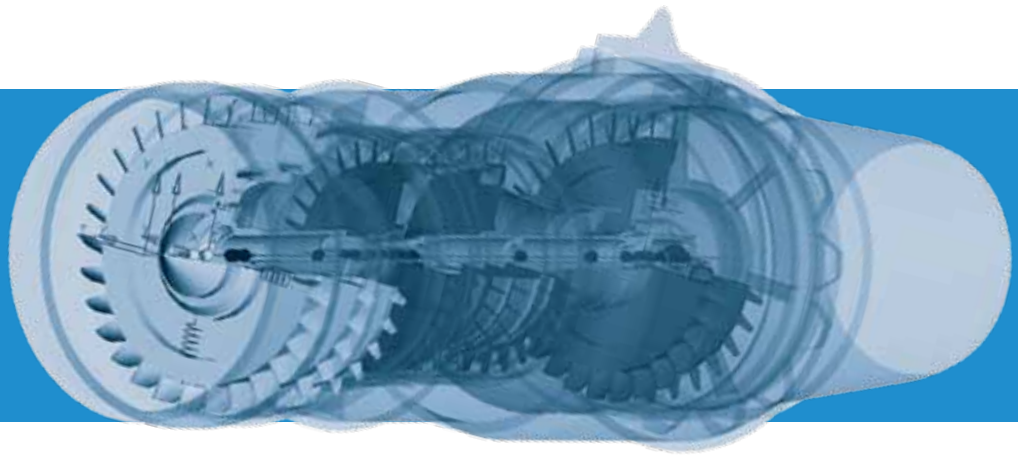

Alfa-Tranzit Co., Ltd was founded in 2000 year. The company has accumulated over 50 years of rotating machinery field design and service experience in Russia and today has become one of the Russian industry leaders in the software, analysis, and design and testing of rotor structures for high performance turbomachinery. Alfa-Tranzit provides a wide spectrum of the engineering service.