6. Structural calculations by finite element method

We offer to carry out numerical calculations by finite element method with expert analysis of results in accordance to requirements of national and EU standards. For calculations we use ANSYS software. We offer long term experience especially in the following areas of application:

- ✓ Rotary blade machines parts exposed to high stress as compressor and turbine wheels, blade hinges, shafts etc.
- ✓ Turbine casings, starter parts and other power engineering applications.
- ✓ Preloaded screw connections.
- ✓ Hinges and other aircraft structure components.
- ✓ Cryogenics.

We provide these types of analyses:

- ✓ Stress-strain analyses from the area of elastic and elastic-plastic tasks.
- ✓ Thermal conduction and thermal stress of structures (conduction, convection, steady-state, transient analyses).
- ✓ Calculations of natural frequencies and dynamic behaviour of structures (transient, harmonic, spectral analysis, random excitation).
- ✓ Calculations in the area of nonlinearities - geometric (high feeds, high deformations, stress stiffening), material (plasticity, creep, temperature dependent material parameters) and contact (surface-to-surface, node-to-surface, node-to-node) with or without friction
- ✓ Durability calculations from the area of high and low cycle fatigue

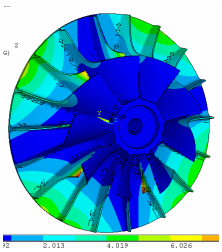

Fig. – Compressor wheel modal analysis

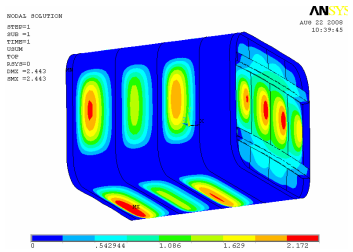

Fig. – Fuel tank strength analysis

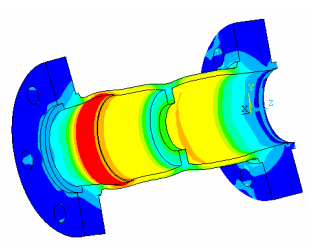

Fig. – Flange strength analysis

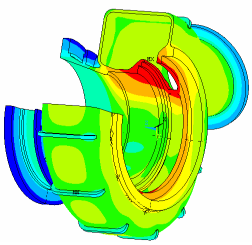

Fig. – Turbine casing strength analysis

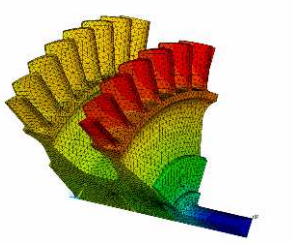

Fig. – APU turbine thermal analysis

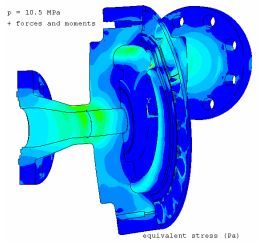

Fig. – Helium circulator casing strength analysis

References:

PBS , a.s. , Aircraft Technique Division

-Strength analyses of APU, TCHJ, TJ100, TP100, TGU100 compressor and turbine runners, including durability evaluation, calculations of natural frequencies and dynamic behaviour of blades and discs.
-Strength analyses of APU, TJ100 casings
-Check of hinges, attachments and other structural parts of APU, TJ100

PBS , a.s. , Machine Shop and Tools Division

- Stiffness test of the jig for propeller blade machining

PBS Energo, a.s.

Steam and expansion turbines of STG I-R-A, STG I-R-C, STG II-R-E, STG I-A, MV550G, ETG, PCPL series:
-Strength analyses and runner optimization including durability evaluation
-Strength check of casings
-Contact analyses of screw connections

PBS Turbo, s.r.o.

Turbo-superchargers of PTR , NR, TCR series:
-Strength analyses and runner optimization including durability evaluation
-Strength check of casings
-Contact analyses of screw connections
-Modal and spectral analysis of NR20/S compressor casing
-Spectral analyses of TCR series filters

MAN B&W Augsburg

-Check of NR 29/S inlet turbine casing deformations
-Strength, modal and harmonic analysis of TCR 18 turbine wheel

ČZ Strakonice, a.s.

K27, C14, C15, C23 superchargers:
-Strength analyses and runners optimization including durability evaluation
-Blade natural frequency calculations

ŠKODA AUTO, a.s.

-Strength analyses of compressor runners and turbo-supercharger turbines

VZLÚ Praha, a.s.

- Strength analysis of measuring line parts