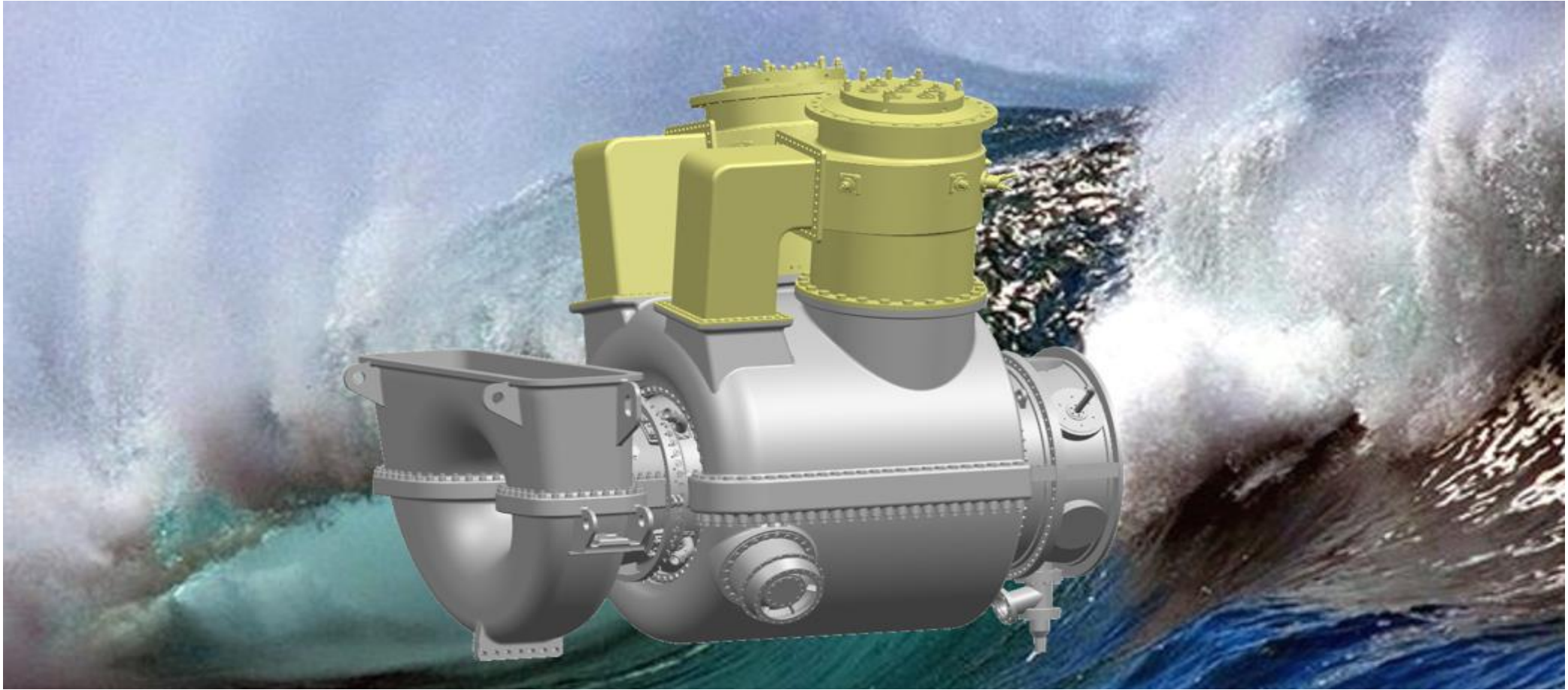


GTPU-006

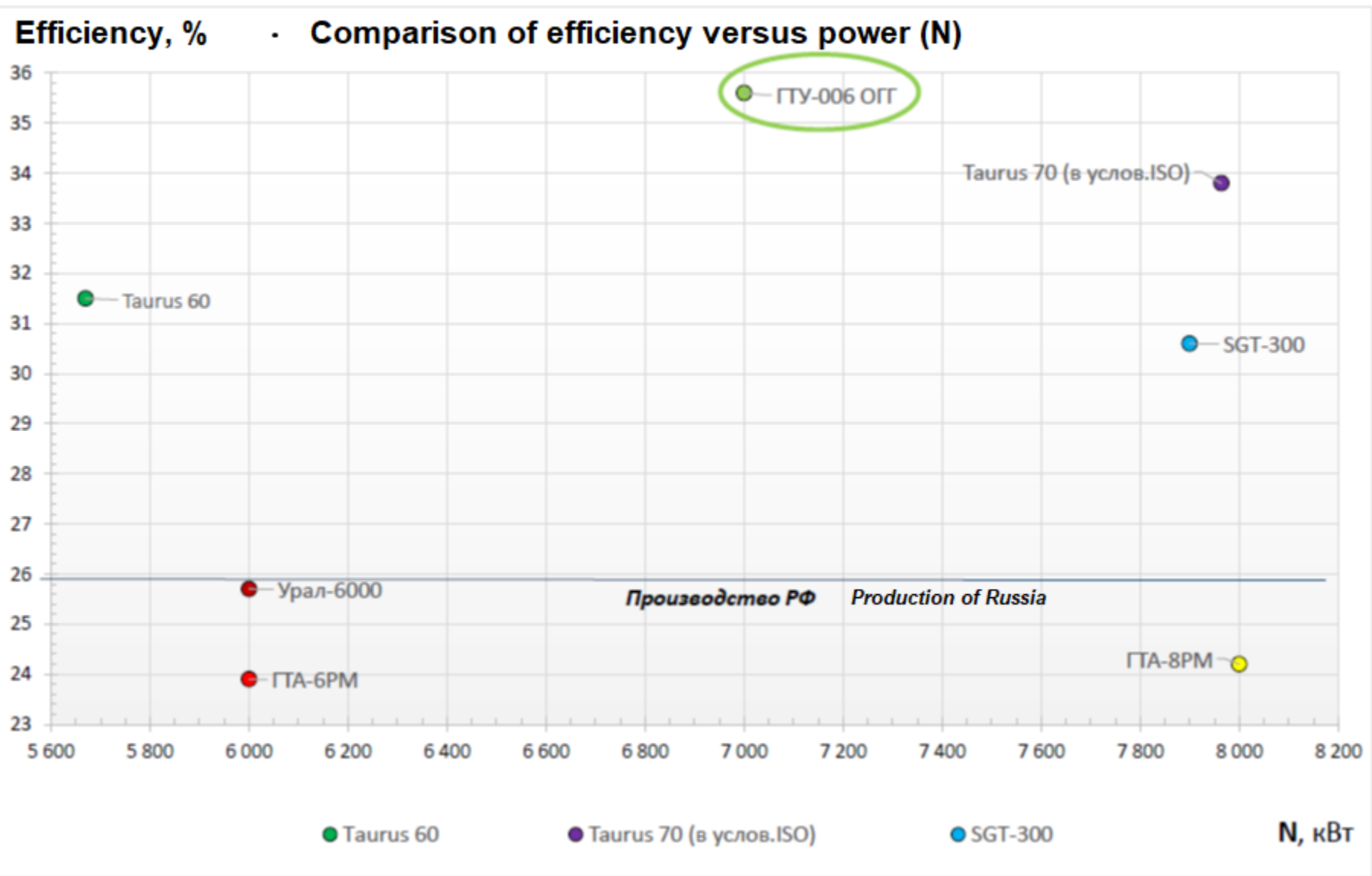


COMPARATIVE CHARACTERISTICS OF GAS TURBINE UNITS WITH A CAPACITY OF 6-8 MW

Characteristics are presented in ISO conditions:
height above sea level - 0 m; There are no pressure losses at the inlet and exhaust; fuel - pure methane
outside air temperature +15°C; relative air humidity 60%

Manufacturer		Solar Turbines	Solar Turbines	Siemens	UEC Gas Turbines	UEC Gas Turbines	UEC Avia-move.	KR Group GT-006
Model	Measure	Taurus 60	Taurus 70	SGT-300	GTA-6RM	GTA-8RM	Ural-6000	GTU-006 OGG
Electrical power at generator terminals	kW	5 670	7,964	7 900	6,000	8,000	6,000	7,000
Specific heat consumption for electricity generation. power	kJ/kWh	11 425	10 505	11,773	15,063	14,888	13,997	10 121
Electrical efficiency	%	31.5%	33,8%*	30.6%	23.9%	24.2%	25.7%	35.6%
Exhaust gas temperature	°C	510	508	540	413	500	474	142
Exhaust gas flow	kg/h	78 280	96,737	107 280	171 360	189 684	122 040	91 120

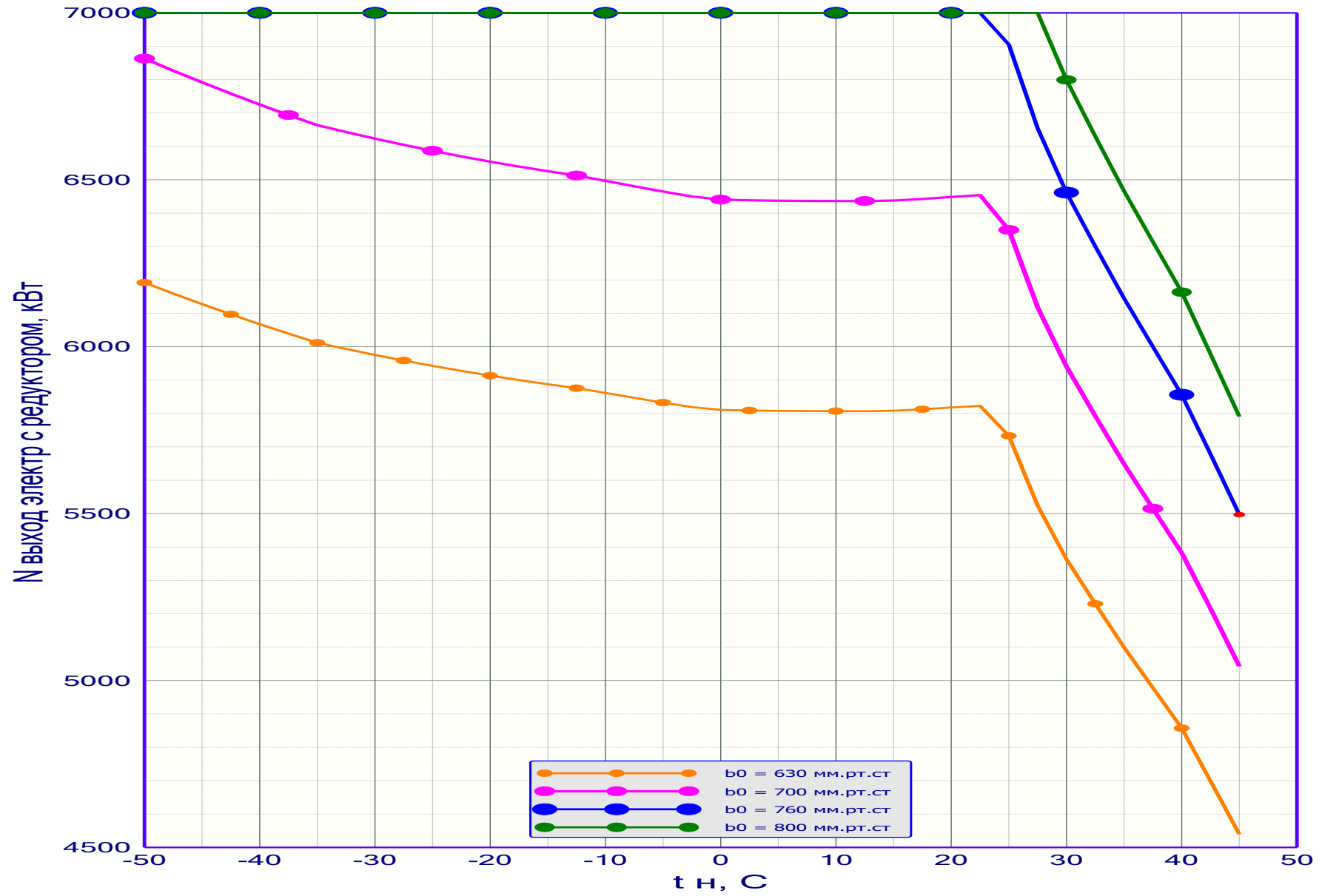
*in ISO conditions





GROUP

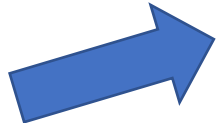
CLIMATIC CHARACTERISTICS



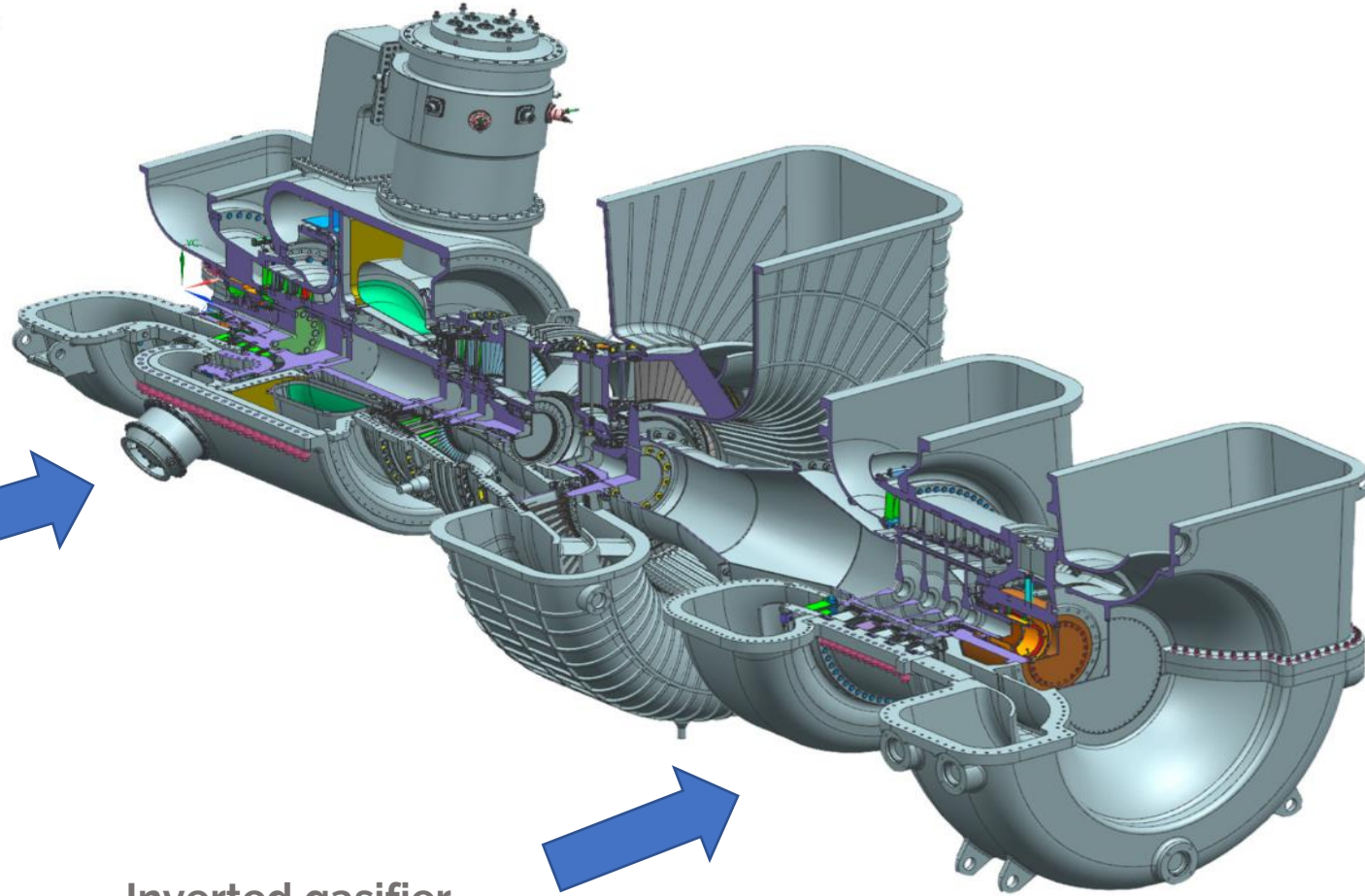
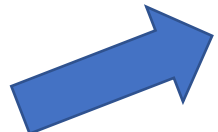
Longitudinal section of GT-006

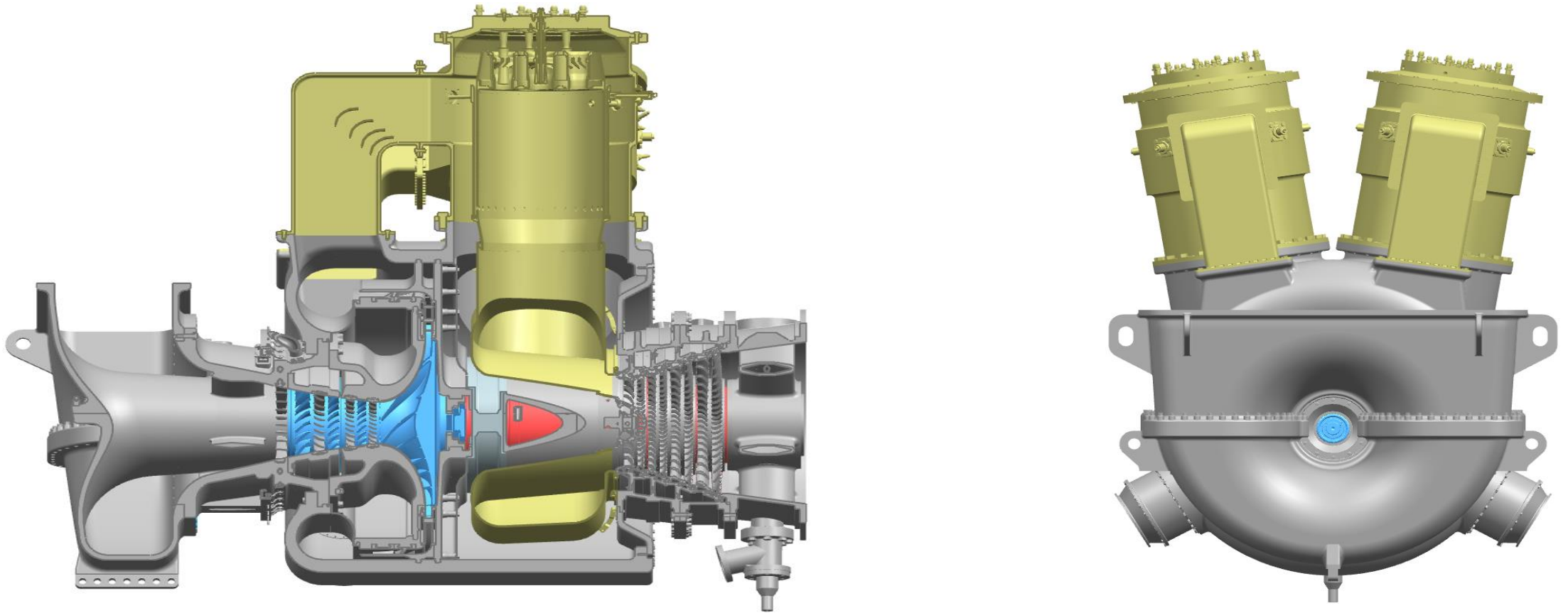
6 КПД:

Gas generator



Inverted gasifier



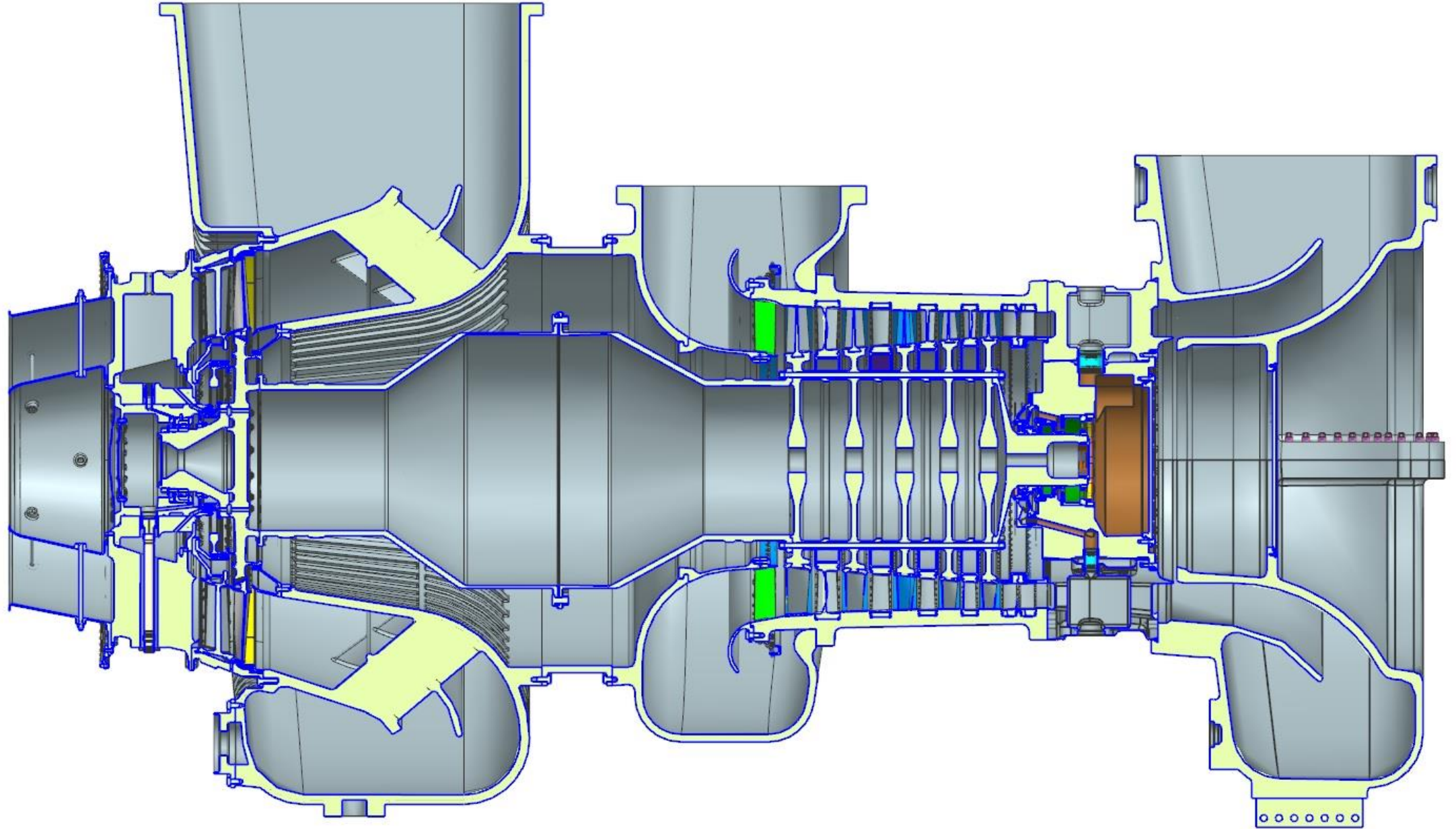


The design of the gas turbine unit has a longitudinal connector - increasing manufacturability (carrying out inspections and repairs of gas turbine units without dismantling from the station)



GROUP

INVERTED GASIFIER

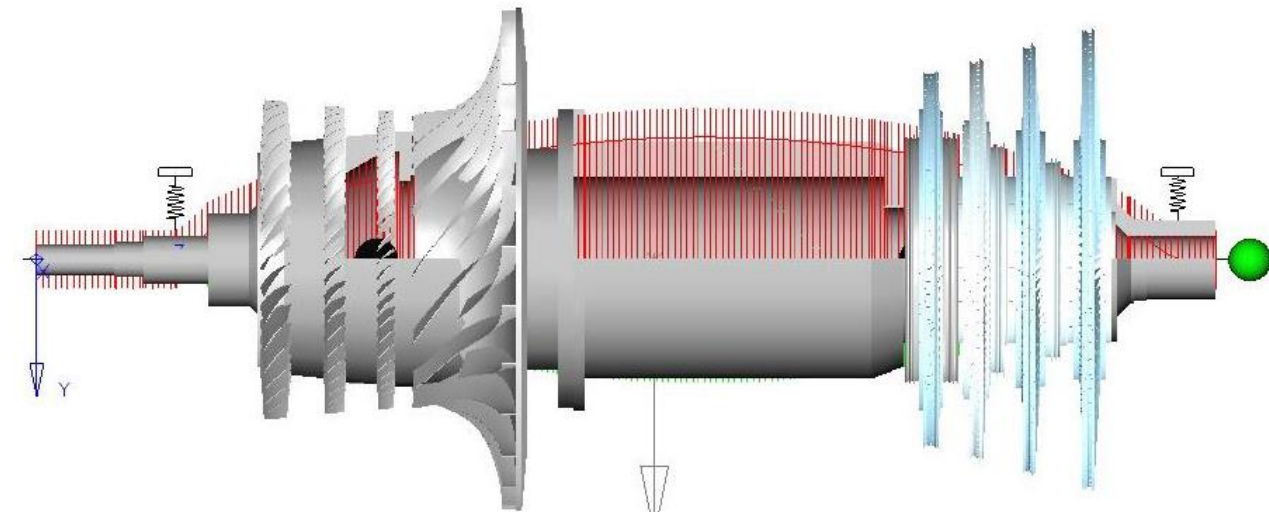
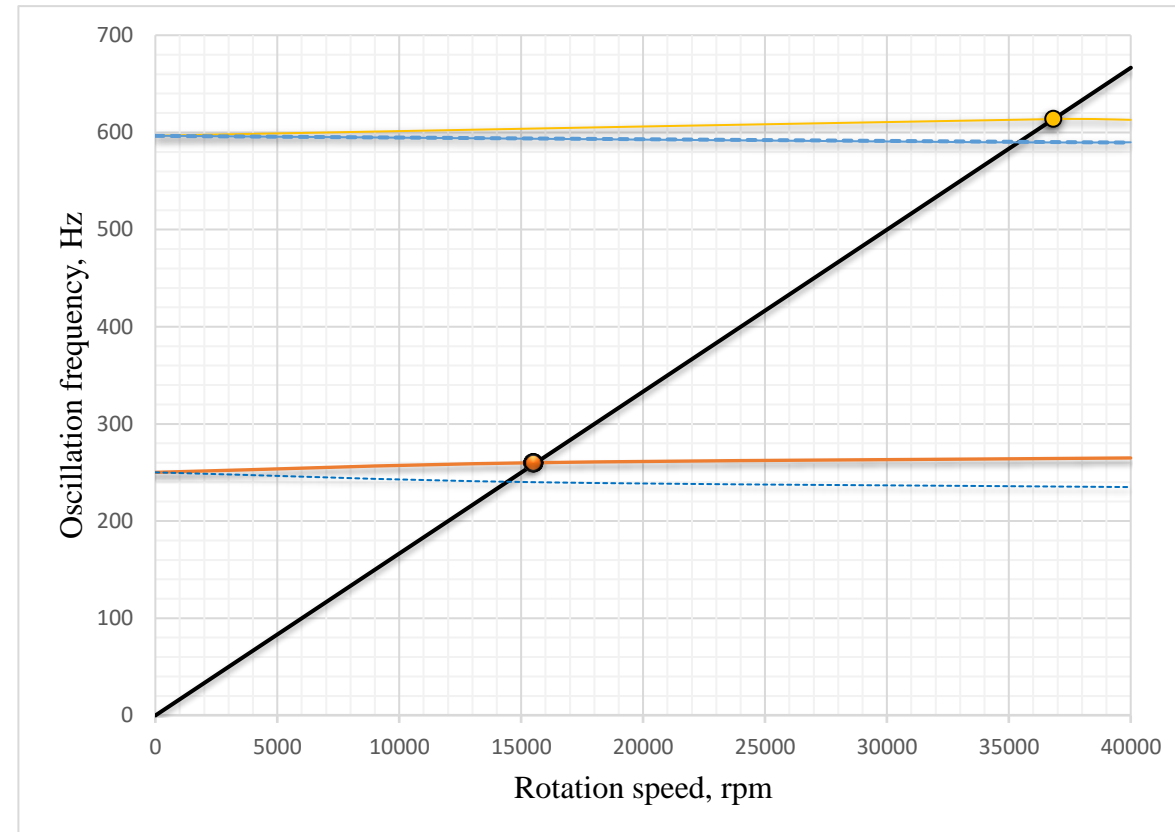


Rotor resonance diagram

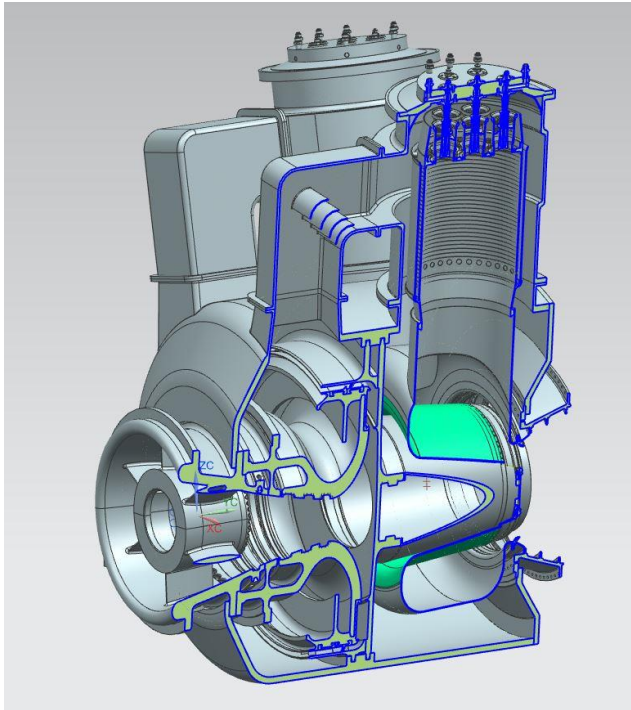
Upper limit of the operating speed range rotor - 11500 rpm. Analysis showed vibration modes excluded from the operating speed range.

n1cr. – 15,488 rpm;

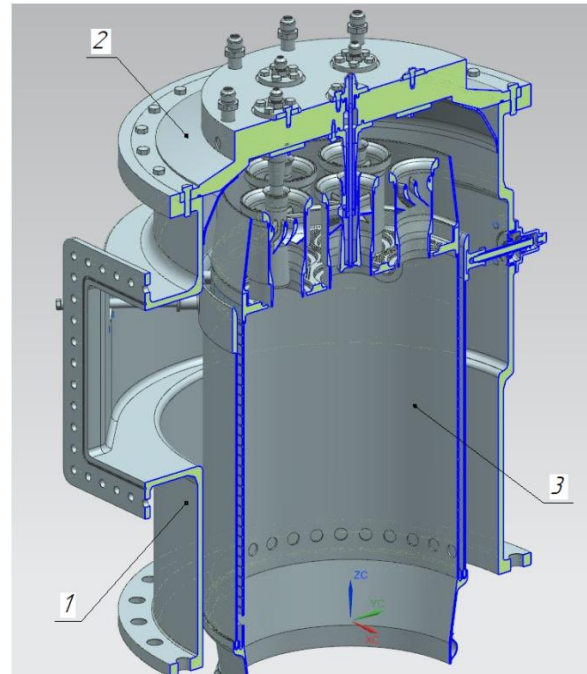
n2cr. – 36,828 rpm.



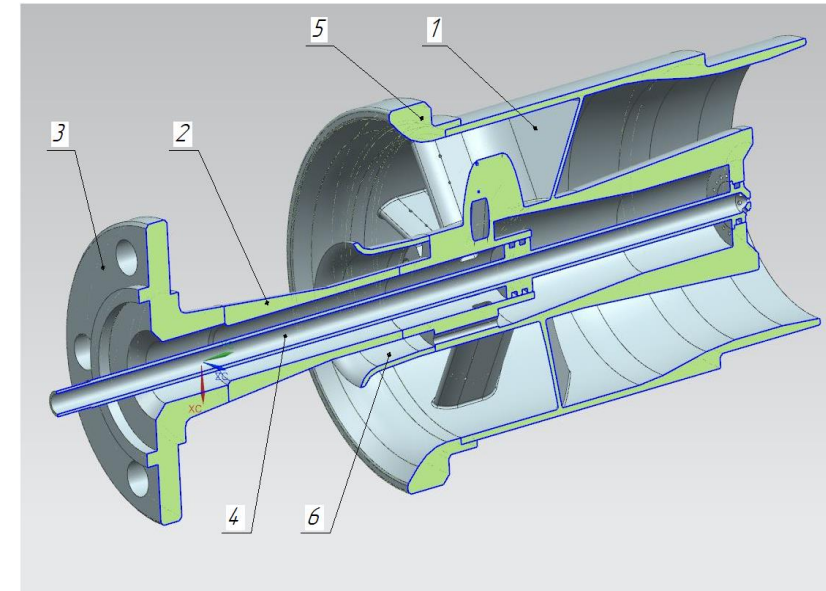
The combustion chamber



Flame tube block

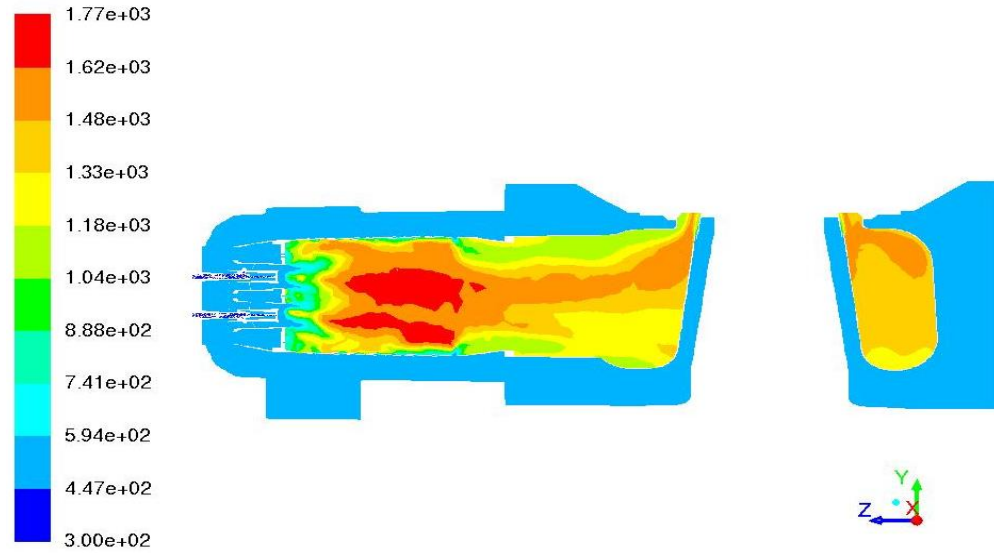
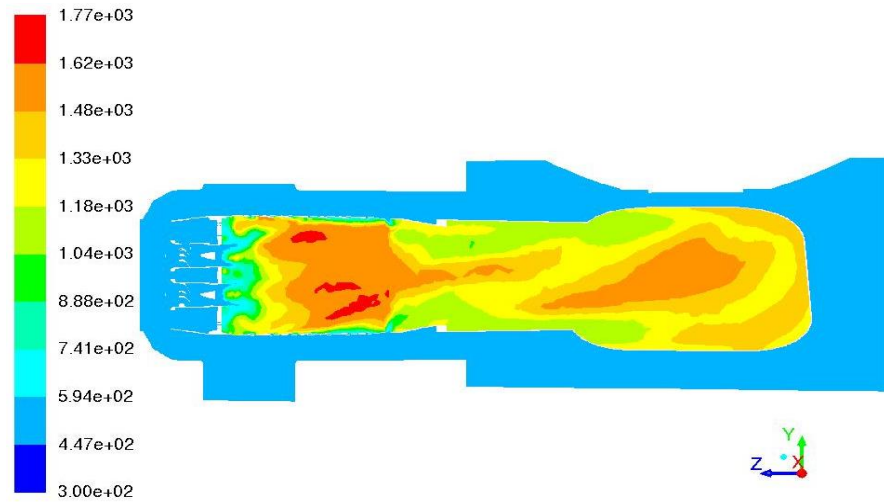


Burner

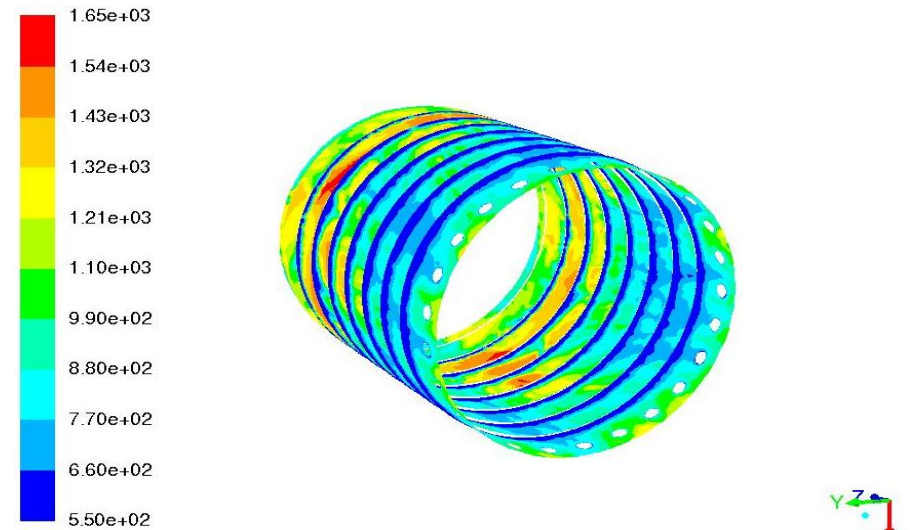
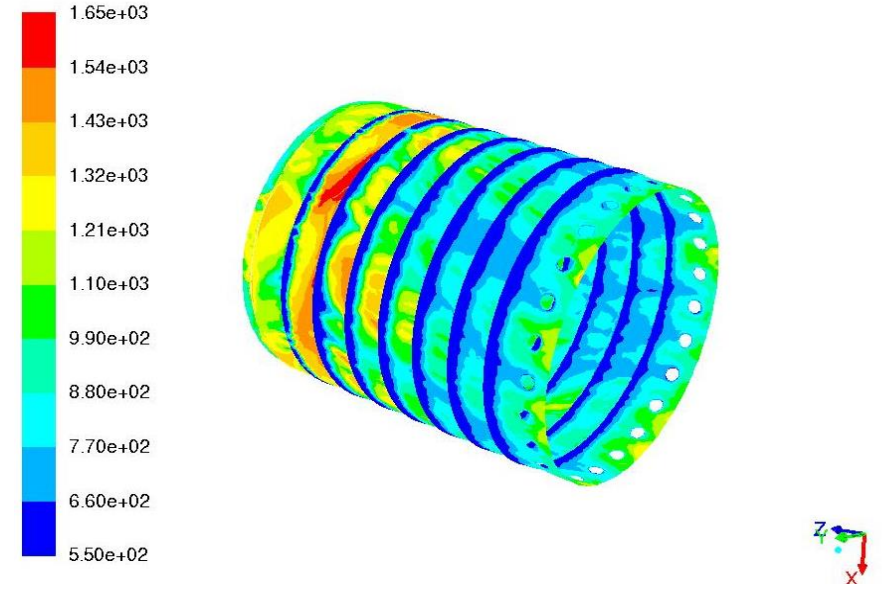




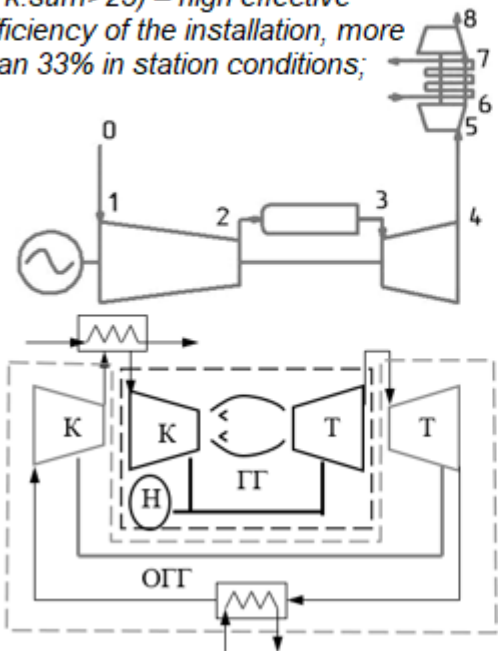
GROUP Total temperature distribution



Temperature distribution along the VT



*cycle with a OGG circuit (cycle with intermediate cooling at $\pi \cdot k \cdot \text{sum} > 25$) – high effective efficiency of the installation, more than 33% in station conditions;



* $T^*g. \text{ max} < 1320 \text{ K}$ – ensuring significant resource indicators;

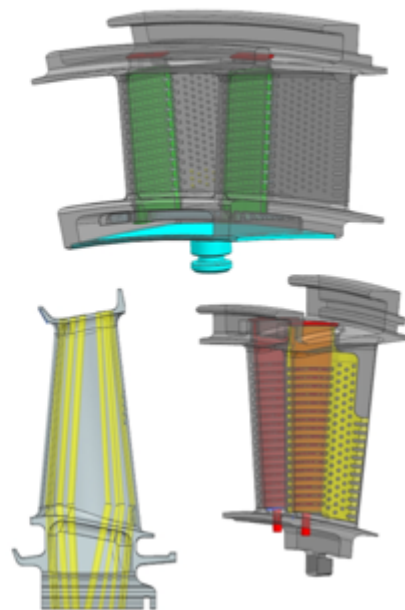
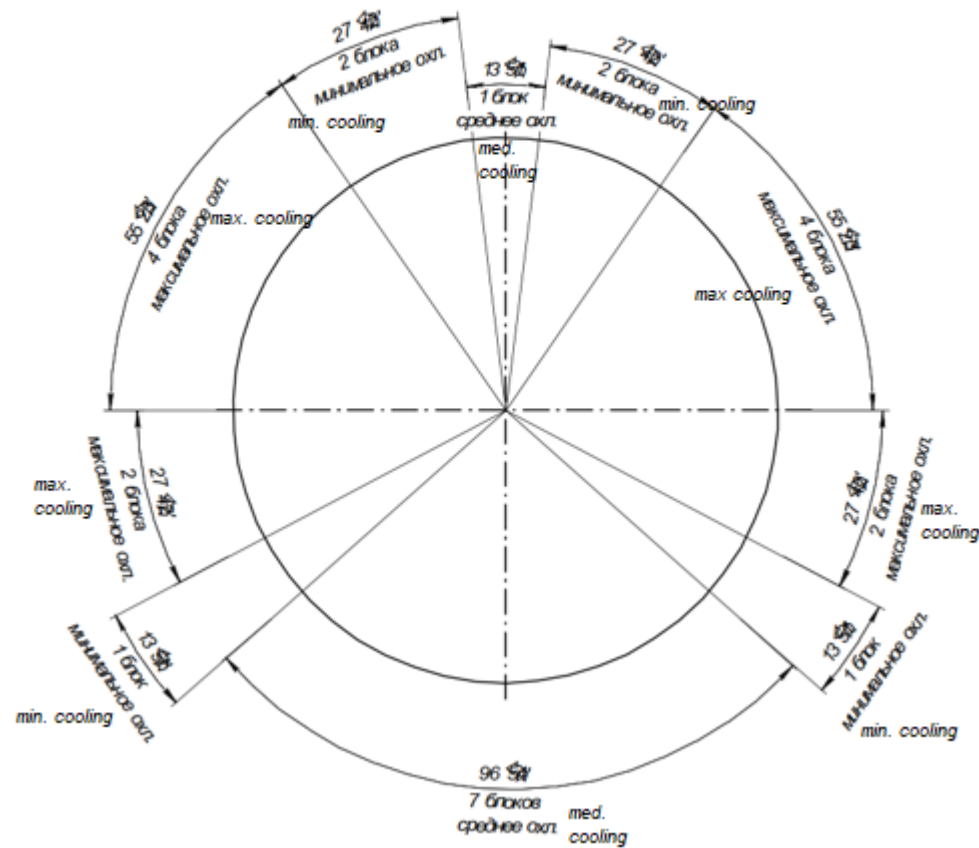
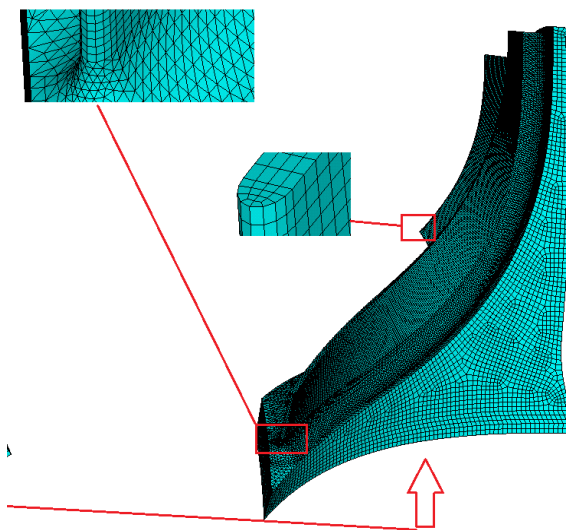
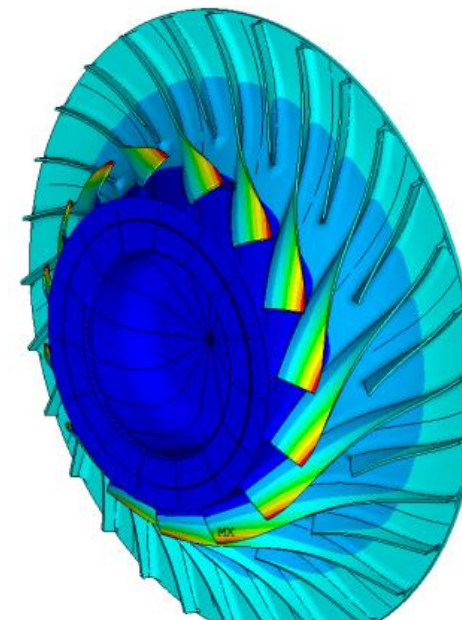
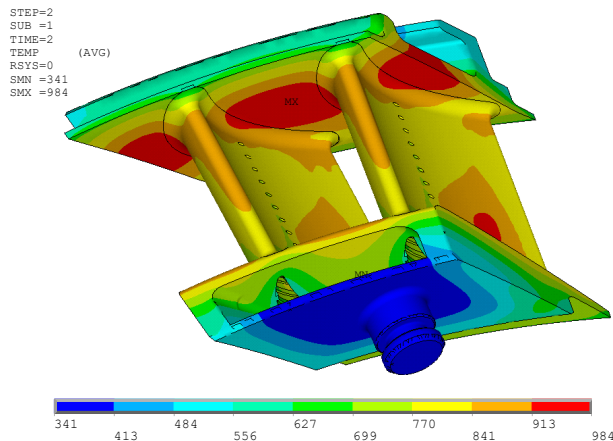
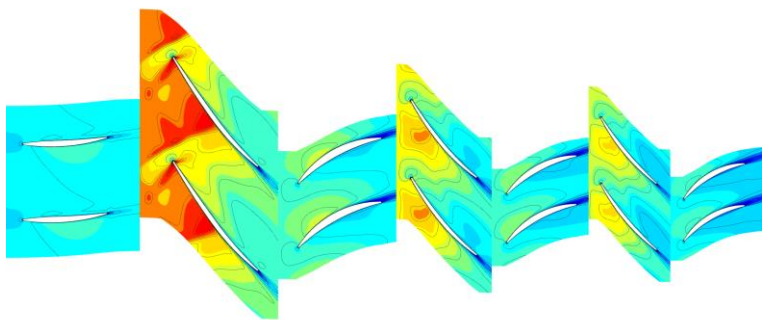


Figure 15 shows a diagram of the arrangement of nozzle blocks with different cooling intensities



Features of the development of GTU-006



Use of modern design tools:
strength and resource indicators,
as well as the parameters of gas turbine units
have been confirmed during numerical simulation –
reduction of technical risks
when developing gas turbine units

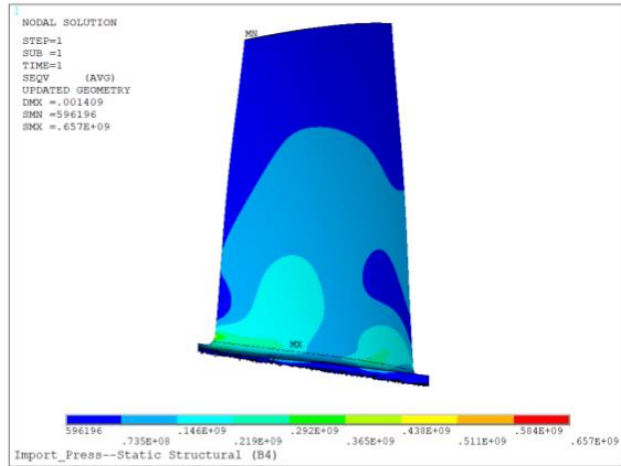


Рисунок 26 — Эквивалентные напряжения по Мизесу 1-й рабочей лопатки (вид на

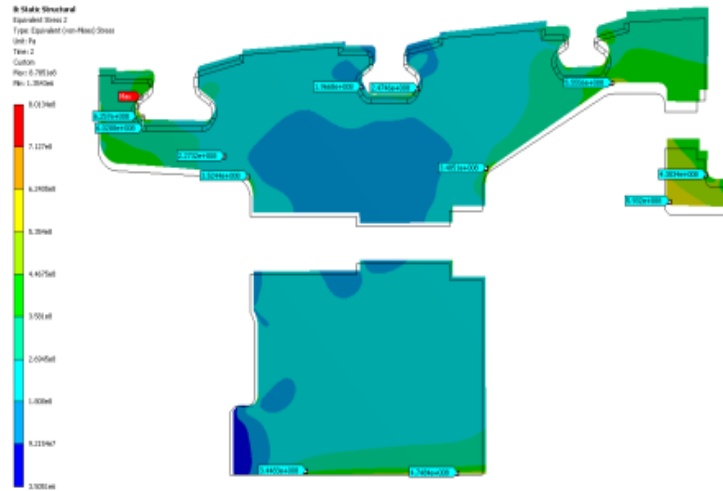


Рисунок 56 — Эквивалентные напряжения диска 1 КГТ на расчетном режиме, Па

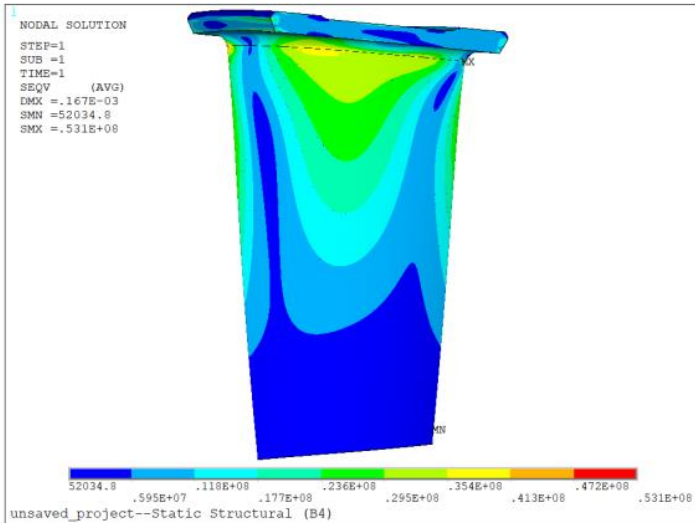


Рисунок 99 — Эквивалентные напряжения по Мизесу 1-го направляющего аппарата (вид на спинку)

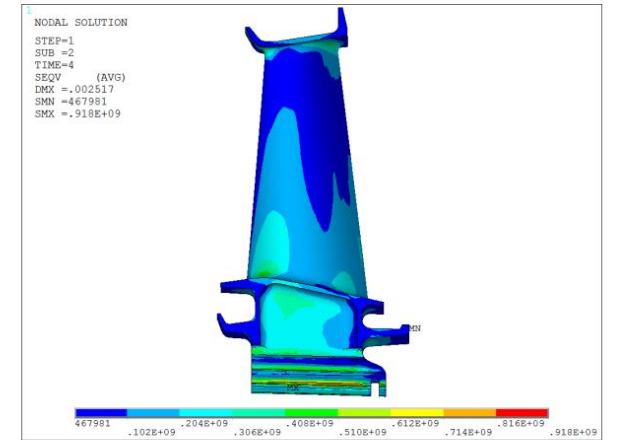


Рисунок 2.10 — Интенсивность напряжений в рабочей лопатке (вид со спинки), Па

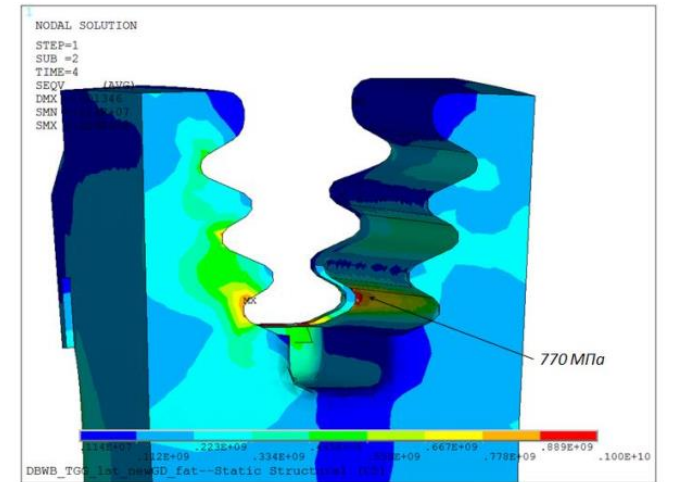


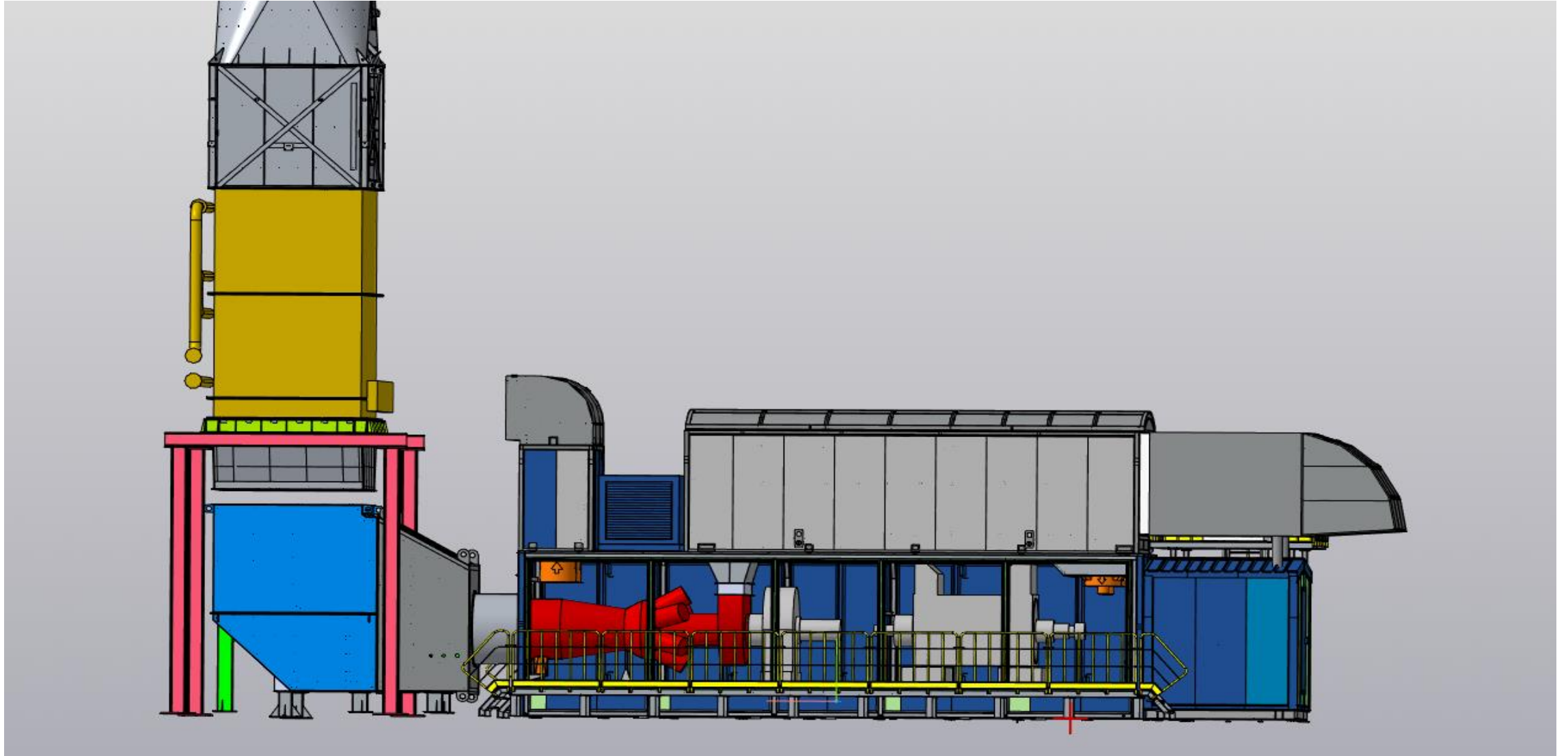
Рисунок 2.74 — Интенсивность напряжений в выступе диска 1 ступени турбины, Па

No.	Contents of the stage	Executor	Term	
1.	Preliminary engine calculation	STM LLC	Done	
2.	Updated calculation	STM LLC	Done	
3.	Final calculation of the gas generator	STM LLC	Done	
4.	Final calculation of the inverted gas generator	STM LLC	Done	
5.	Final calculation of the gas generator combustion chamber	STM LLC	Done	
6.	3Dmodel GTU-006	STM LLC	Done	
7.	Development of design documentation for GG	MC IED-Holding LLC	April 2024	
8.	Development of design documentation for OGG	MC IED-Holding LLC	May 2024	
9.	Development of design documentation for GTU-006	MC IED-Holding LLC	November 2024	
10.	Manufacturing of a prototype GTU-006	MC IED-Holding LLC	September 2025	
11.	Development of design documents for packages	IC Volga LLC	November 2024	
12.	Making a package	MC IED-Holding LLC	September 2025	
13.	Testing of the first prototype	MC IED-Holding LLC	November 2025	

STATUS OF DEVELOPMENT DESIGN DOCUMENTATION

No.	Contents of the stage	Executor	Term	
1.	GTEU - 006	MC IED-Holding LLC	November 2024	
2.	GTU - 006	MC IED-Holding LLC	November 2024	
3.	Gas generator	MC IED-Holding LLC	April 2024	
4.	Inverted gasifier	MC IED-Holding LLC	May 2024	
Gas generator				
5.	Front support GG	MC IED-Holding LLC	March 2024	
6.	GG compressor	MC IED-Holding LLC	Done	
6.1.	Compressor rotor	MC IED-Holding LLC	Done	
6.2.	Compressor stator	MC IED-Holding LLC	Done	
7.	GG combustion chamber	MC IED-Holding LLC	Done	
8.	Turbine GG	MC IED-Holding LLC	March 2024	
8.1.	GG turbine rotor	MC IED-Holding LLC	Done	
8.2.	GG turbine stator	MC IED-Holding LLC	Done	
8.3.	GG Turbine Support	MC IED-Holding LLC	February 2024	
9.	Power frame GG	MC IED-Holding LLC	Done	

No.	Contents of the stage	Executor	Term	
Inverted gasifier				
10.	Turbine	MC IED-Holding LLC	May 2024	
11.	Turbine support	MC IED-Holding LLC	May 2024	
12.	Turbine rotor	MC IED-Holding LLC	February 2024	
13.	Turbine stator	MC IED-Holding LLC	May 2024	
14.	Compressor	MC IED-Holding LLC	May 2024	
15.	Compressor rotor	MC IED-Holding LLC	Done	
16.	Compressor stator	MC IED-Holding LLC	Done	
17.	Rear support OGG	MC IED-Holding LLC	March 2024	
18.	Power frame OGG	MC IED-Holding LLC	Done	



Planned expenditures on R&D and expansion of production base

№	Stage name	Stage Cost with VAT, million rubles	Stage completion period
1	Design engineering	-	done
2	Development of design documentation	129,1	1 half 2024
3	Preparation of production	334,6	2 nd half 2024-1 st half 2025
4	Production of a prototype, including corrections	380,1	2 nd half 2025
Total completion of R&D		843,8	
5	Construction/Expansion of production base (7400 sq. m.)	745	2025
TOTAL:		1588,8	