

Company ELEMENT

**Leading organization of Ukraine Ministry of Industrial Policy
in science direction «Electronic systems of measuring,
parameters monitoring and control of aviation engines»**

**Scientific organization, which is introduced in Ukraine State
Register of science organization**

**Member of International Associations of Aero-engines
manufactures**

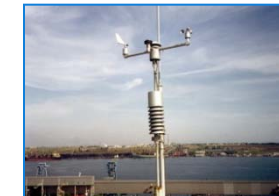
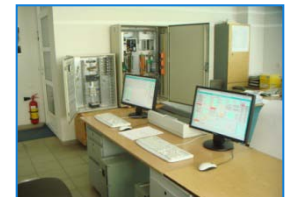
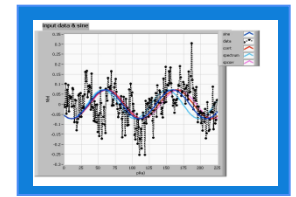
Licenses and certificates

- Developer of aeronautical engineering components is certified by Interstate Aviation Committee,
- Developer of aeronautical engineering components is certified by Ukrainian State Aviation Administration
- Production approval certificate that is issued by Ukrainian State Aviation Administration
- License on development, production, selling, repair and modernization of military equipment, which is issued by Ukraine Ministry of Industrial Policy,
- Certificate of leading scientific organization in science direction “Electronic systems of measuring, parameter monitoring and control of aviation engine” which is issued by Ukraine Ministry of Industrial Policy,
- Certificate of State Registry of scientific organizations issued by Ukraine Ministry of Education and Science.



Main scientific and technical directions

- Measuring transducers
- Electronic systems of GTE parameters measurement
- Electronic control systems and regulators for GTE
- Program and technical complexes for aviation engine testing
- Embedded real-time applications
- SCADA system for engine testing
- Monitoring and simulation software
- Gas-turbine engine models
- Trend and correlation analysis tools
- Weather stations industrial and military
- Control systems for wind power and wind-diesel power stations.



Pressure transducers

Pressure transducers of
absolute, gauge, expansion and
differential pressure with
-analog output 4 – 20 mA,
-analog output 0-100 mV
-digital output RS 485

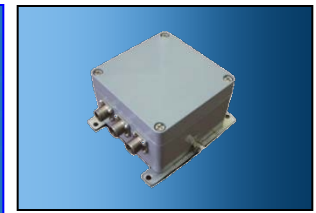
Advanced options:

- automatic network configuration,
- registration of operating time,
- registration of overtemperature,
overpressure, overvoltage;
- remote calibration



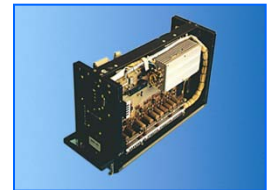
Electronic systems of GTE parameters measurement

- SID-4B Pressure Measurement System for engine D-27, aircraft An-70
- SID-4A System for measuring of air and oil in engine D-27 at bench testing
- SID-3 Pressure Measurement System for engine AI-22, D-436T aircraft Tu-234, Tu-334
- SID-3-148 Pressure Measurement System for engine D-436T-148 aircraft An-148
- P-330-1 3-channel Pressure Pulsing Transducer
- P-330-2 3-channel Transducer of Quick Pulsing Pressure for low-emission chamber
- SKUP-1 System of Angle Position Monitoring of transformer shaft
- SKUP-1 System of Angle Position Monitoring & Simulation of transformer shaft



Electronic GTE regulators

RDTs-450 Digital Regulator (FADEC) for engine AI-450



RDTs-450M Digital Regulator (FADEC) for engine AI-450M

BRT-25 Regulator of exhaust temperature for engine AI-25TLSh aircraft L39



BRT-K Regulator of exhaust temperature for engine AI-25 TLKM aircraft K8-J

BRT-117 Regulator of exhaust temperature for engine TV3-117-VMA-SBM1-V helicopter Mi



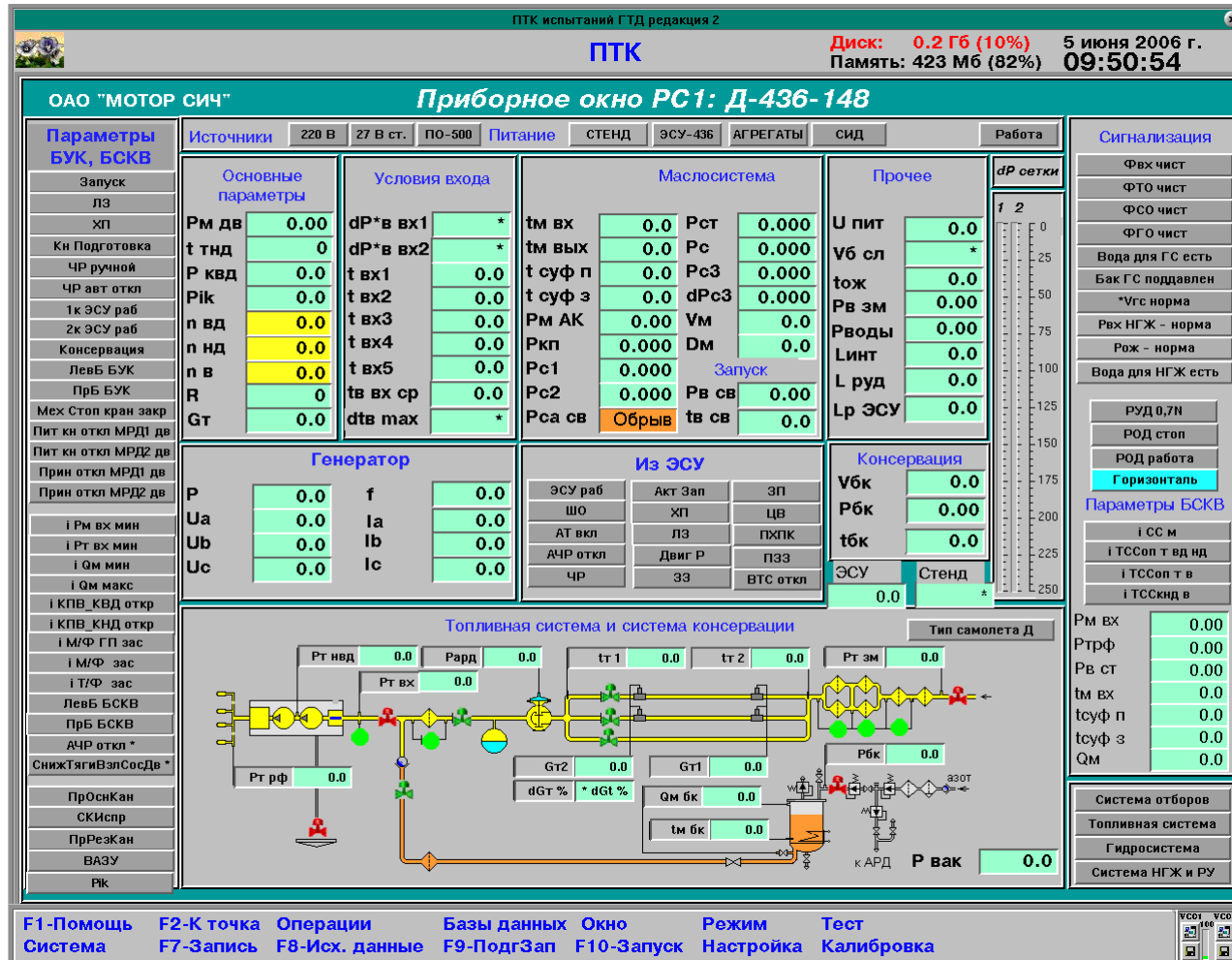
ERGG-SBM1 Electronic Regulator for engine TV3-117-VMA-SBM1 bench testing

Program-technical complexes (PTK) for GTE test

- ASSOD-1550 Automatic data collection & data processing system for bench testing of engine VK-1500
- PTK - VDMR for bench testing of helicopter engine AI-450
- PTK - DMR for bench testing of engine AI-450MS
- PTK - D5T for bench testing of engine AI-222-25
- ARPP Mobile Automatic Parameters Recorder
- PTK-436-148 for bench testing of engine D-436 / D-36
- PTK - 436/36 for bench testing of engine D-436-148 / D-36
- PTK - 450/500 for bench testing of engine MS-400 and gas generator MS-500



Data visualization



Visualization setup

КПА-450

КПА блока РДЦ-450

Диск: 7.7 Гб (79%) 27 марта 2007 г
 Память: 459 Мб (48%) 11:28:58

Канал 1 Канал 2

Дискретные

ПодгЗап	ЧРЗапр
ПодгХП	Ртн
ПодгЛЗ	ТФзас
СТОП	МФзас
Запуск	Рм мин
ОПШ	ТССРед
ОЛШ	ТССТур
Т/к	Корпст
ДвЛев	Корпст
ДвПрав	

Команды

ВклАЗ	ШПРТ
ВклСтР	Селек
ВклСт	Ст луск

Сигнализация

ВысОб	СтрМФ
НисОб	ПлдТфз
ПредТг	ОгрРеж
РучУпр	Рм мин
Дв отк	Совбщ
ТФзас	Вкл ЧР
maxсуф	tm вел
ОткВлб	ПВ
ОткОбм	ОВ

Текущие Задания

п в	0,0	0,0
п ст	0,0	0,0
п тк	0,0	0,0
т*г	0	0,0
Мкр	0,0000	0,0000
п'тк	0,0000	0,0000
gradt*	0,0000	0,0000
птк	0,0000	0,0
пст	0,00	
Мкр	0,0000	
Аруд	0,00	

56000.0
50400.0
44800.0
39200.0
33600.0
28000.0
22400.0
16800.0
11200.0
5600.0
0.0

0 5 10 15 20 25 30 35

Аналоговые

Масло, топливо

tm	0,00
t	0,00
Ррф	0,00
Ррф	0,00
Ррф	0,00

Расходы

Ст	0,00
Гкс	0,00
Гза	0,00
Гп	0,00
Гс	0,00
Гми	0,00

Признаки

ГотЗап	Земля	Ртдмин	КаналА
ГотХП	Взлет	пст макс	КаналБ
ГотЛЗ	ВклЧр	пст мин	ОснКан
ЗапИдет	Дв раб	пткпра	ТК
ХП Идет	Двнераб	птк вел	ТК Дв Р
ЛЗ Идет	Дв отк	Тмказ	РДЦПК
ДопРасх	Дв отк	Тмказреж	КонтВы
ИППТ	Тм мин	АЗСТ	Влб НК

Свойства

Наименование	Значение
Имя компонента	
Левый	145
Верхний	75
Ширина	70
Высота	20
Расположение текста	Выравнивание по центру по
Текст	Текст
Структура данных	РДЦ-450
Параметр	nst
Цвет заливки	0x00FFFFFF
Шрифт	0x00000000System10lb
Формат	Дробное
Точность	1
Только чтение	Откл
Подсказка	Выкл
Минимум	-1e15
Цвет минимума	0
Текст минимума	
Максимум	1e15
Цвет максимума	0
Текст максимума	
Цвет ошибки	0x00FFFFFF
Грани	Вкл
Кнопка	Выкл
С фиксации	Выкл
График	Graphic1
Цвет графика	0x00008000

Оформление

ВклА	Нет
ВклСт	<input type="checkbox"/> Частоты
Ст луск	<input type="checkbox"/> Амплитуды
Селек	<input type="checkbox"/> Температуры
ДвРсо	<input type="checkbox"/> Давления
	<input type="checkbox"/> Углы
	<input type="checkbox"/> Электрика
	<input type="checkbox"/> Расчетные
	<input type="checkbox"/> Времена
ОткМс	<input type="checkbox"/> Расчетные2
ОткШР	<input type="checkbox"/> Исходные данные
ОткРл	<input type="checkbox"/> Аварийные
ОткАр	<input type="checkbox"/> Орег
ОткАл	<input type="checkbox"/> Дискретные входы
ОткВыс	<input type="checkbox"/> Дискретные выходы
ОткКа	www
ОткСел	
ОткСт	

Ok

NUM канал 1

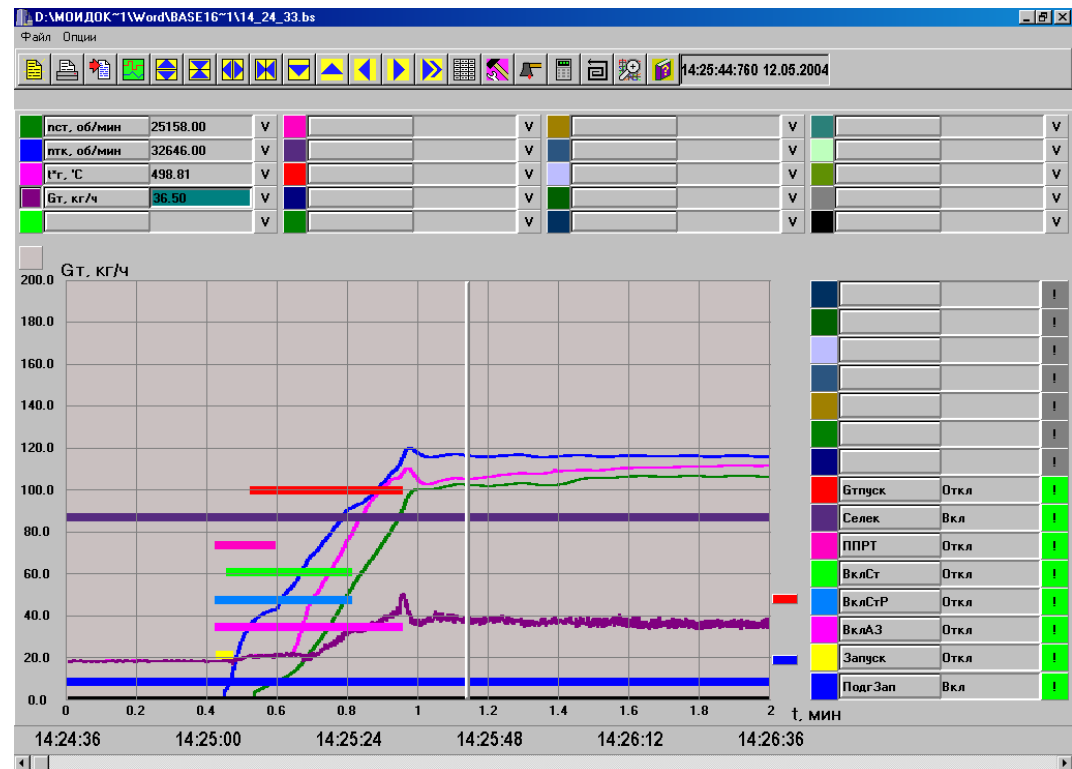
1	2	3	4	5	6	7	8	9	10	11	12	13	Ос
F1-Помощь	F7-Запись	Утилиты											
Система	Исходные данные	Настройка											

4 5 6 7 8 9 10 11 12 13 Отк Отк

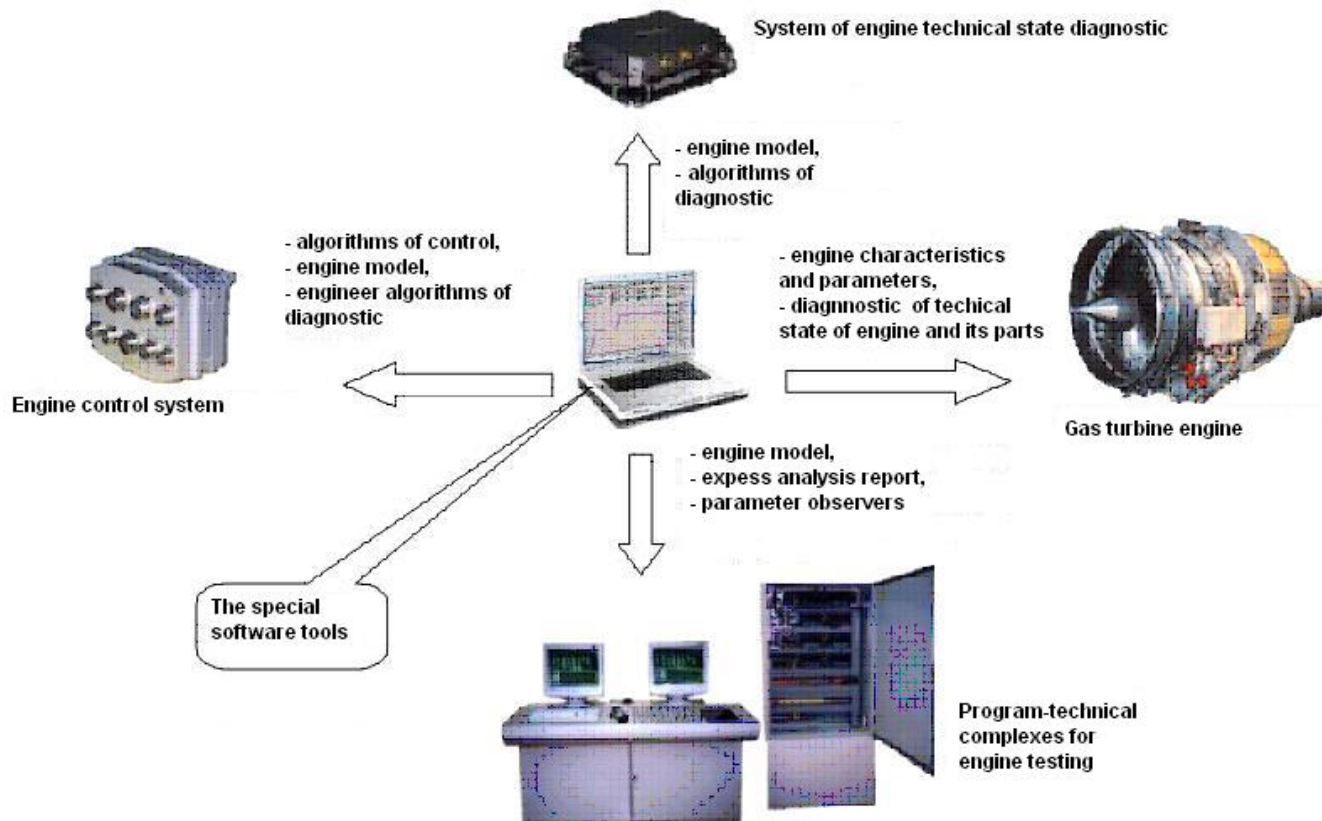
	Принято	Потеряно	Ошибок КС	Потерь связи
канал 1	0	0	0	0
канал 2	0	0	0	0

Database navigation

- ✓ graphical and text displaying;
- ✓ easy-to-use interface;
- ✓ level and time zooming
- ✓ parameter and color configuration
- ✓ smart cursor;
- ✓ parameter slice;
- ✓ printing;
- ✓ static characteristic;
- ✓ export to other formats and mathematical processing.

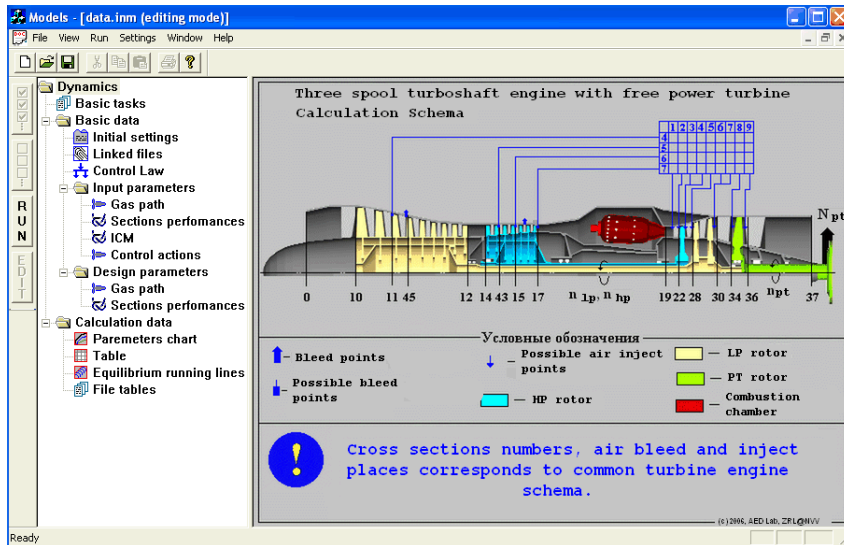


HW & SW complex «Energy-XXI»



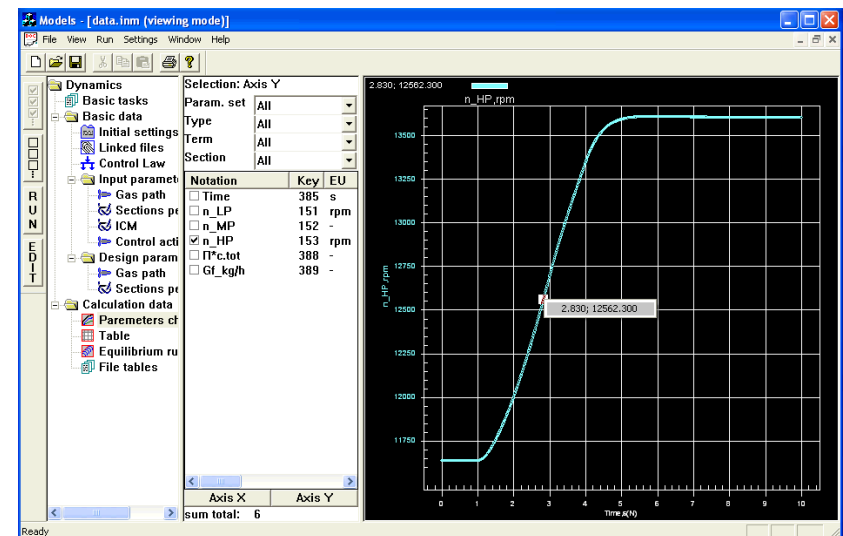
HW & SW complex of modeling, controlling and diagnostic of technical state of gas turbine engine based power sets

Cooperation with National Aerospace University “KhAI”



Development of fast calculated multi-mode dynamic models of turbine engine

Turbine engine real-time simulation procedures for semi-natural test-cells and on-design face of electronic control system



Cooperation with National Aerospace University “KhAI”

Methods and means of turbine engine parametric diagnostics and monitoring

- Engine parameters monitoring procedure using normal condition models, formed by means of identification methods, captured information during engine testing or initial operation period.
- Monitoring parameters deviation trend-analysis procedure for early faults detection and prediction.

Часовые срезы - RETRO System / Universal Edition

File Settings Analysis DataBase Service Window Help

КС ДОНСКАЯ 01 Administrator

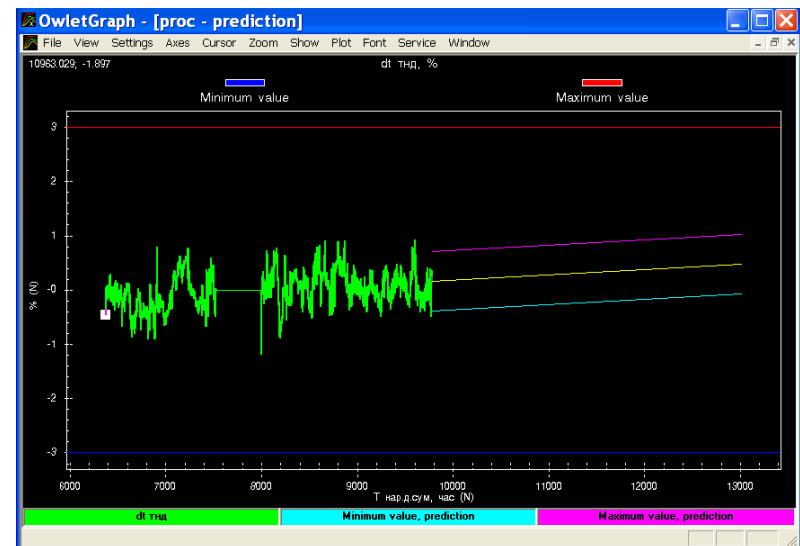
Date: 01/10/2004 Time: 20:08:43 Operating time, hrs: 6373.734 Проточная часть двигателя

	Date	Time	а дж, %	t пс, С	t пс сред, С	t пс мед., С	G T, кг/час	N e, кВт	n
▶	01/10/2004	20:08:43	39.472	413.775	404.591	0.000	4426.035	15521.848	9
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▶	01/10/2004	22:08:43	39.611	442.066	431.739	0.000	4555.845	16807.070	2
▶	01/10/2004	23:08:44	39.784	442.866	432.585	0.000	4551.740	16795.791	3
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▶	02/10/2004	03:08:45	39.240	440.452	430.357	0.000	4459.108	16252.795	7
▶	02/10/2004	04:08:45	39.278	440.745	430.614	0.000	4460.146	16260.802	7
▶	02/10/2004	05:08:45	39.209	440.874	430.853	0.000	4458.380	16246.483	5
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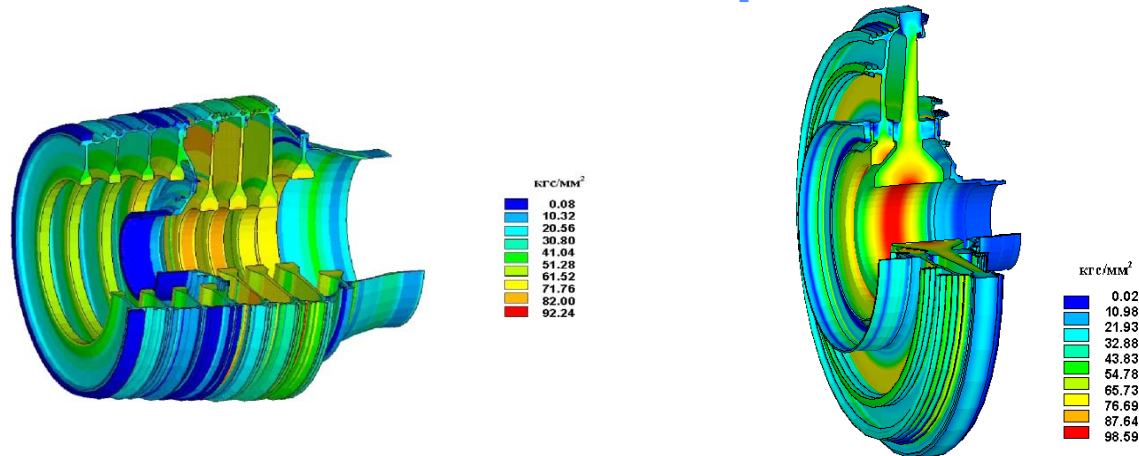
Working (d:\temp\donskaya\wois\982\Запись: 1/3400) Запись не блокирована

Cooperation with National Aerospace University “KhAI” Methods and means of turbine engine parametric diagnostics and monitoring

- Engine and subsystems (flow path, lubrication system etc.) ability of diagnostic analysis procedure, reliability definition of fault recognition, selection of optimal set and accuracy of measured parameters.
- Sensor faults detection procedure using information redundancy and engine subsystem mathematical modeling.



Cooperation with National Aerospace University “KhAI”



- Development of the fast calculating monitoring models of temperature and stress state critical GTE parts on steady-state and transient modes based on upper level computer models.
- Integration of monitoring models of temperature and stress states into lifetime depletion account systems.
- Lifetime depletion of critical gas turbine engine parts monitoring methods based on dynamics temperature and stress states identification.

Special purpose production



БРТ - regulator of exhaust temperature



РДЦ-450 engine digital regulator



СПВ -290 airflow meter

П 317 barometric pressure transducer



Комплекс Б44 "Улыбка"

License on development, production, selling, repair and modernization of military equipment issued by Ministry of Industrial Policy of Ukraine



СВД-4Б Pressure Measurement System



Ка-226

РДЦ-450 engine digital regulator



СИПА Weather Stations

РИГА -МАНМК Weather Stations



Комплекс лазерной подветки цели



2AMK Weather Stations



Комплекс звукометрической разведки

Development services

- **Real-time systems, including systems of control;**
 - **Embedded systems;**
 - **Data acquisition, monitoring and diagnostic systems;**
 - **Measuring systems;**
 - **Sensors, transducers and I/O modules;**
 - **Testing equipment, simulators etc;**
 - **SCADA systems;**
 - **DBMS;**
 - **Special software for modeling, diagnostics, identification and other kind of mathematical processing;**
 - **Software drivers for devices.**
-

**We are looking forward to cooperation
for achievement of the global purposes**
