

ENERGY SAVING

IN PUMPING SYSTEMS

up to 40 %

IN THERMAL POWER PLANTS

3 to 6 %

SM PUMPS
2021

Our main activity

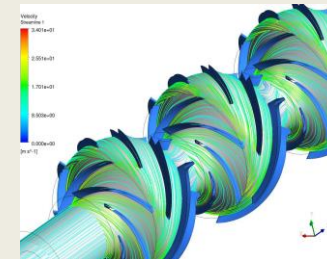
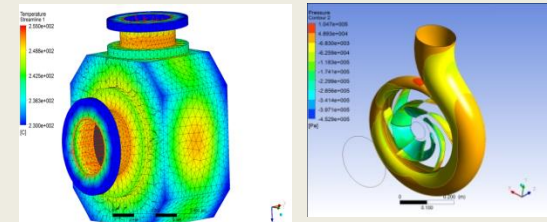
KNOW-HOW TRANSFER

In following sectors

NUCLEAR SECTOR
OIL&GAS SECTOR
INDUSTRY
WATER SUPPLY
IRRIGATION

Other activities

SPECIAL PUMPS PRODUCTION
ENERGY SAVING
OPTIMIZATION
REFURBISHMENT
SOFTWARE
TRAINING COURSES



1. ENERGY SAVING IN PUMPING SYSTEMS

Possible reduction of energy consumption up to 40%

95% of analyzed pumping systems in last 30 years operate outside optimum

Total saved energy more than 50 MW

Payback time for investment 3 -24 months

HOW TO REACH ENERGY SAVING

- **APPLY PUMPS WITH HIGHEST EFFICIENCY**
- **OPTIMIZE THE PUMPS OPERATION IN THE SYSTEMS**

Procedure:

- **Analyze the pump characteristics**
- **Analyze the optimal system requirements**
- **Calculate possible energy saving**
- **Calculate expenses**
- **Calculate payback period of time**

Optimize the pumps characteristics is possible as follows:

- **Replace the impellers**
- **Replace impellers and casings/diffuser**
- **Replace the complete pumps**

DESIGN, REFURBISHMENT

Improving the pumps characteristics

Optimization of the pumps in the systems and energy saving

Efficiency

Cavitation characteristics

Abrasion characteristics

Rotor dynamic characteristics

Pumps refurbishment

Rehabilitation of existing pumps

Improving the life time of hydraulic parts

Improving the shaft characteristics, vibration, critical speed

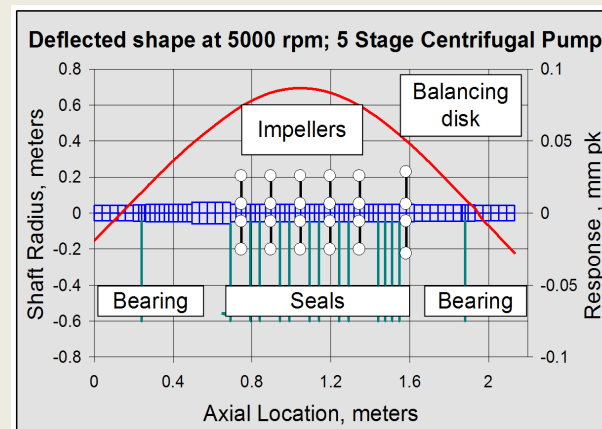
Customized pump manufacturing

Manufacture pump with same or better characteristics and dimension as existing pumps

– no need pipelines and foundation modification



**Machined impellers from forged solid part
Improving Life time, efficiency, NPSH**



Rotor dynamic shaft analyze

DESIGN, REFURBISHMENT

Optimization the maintenance expenses

Optimized the maintenances expenses and improving life time of the pumps consider as follows:

pump type

Q –H stability and inclination, flow analyze

NPSH analyze

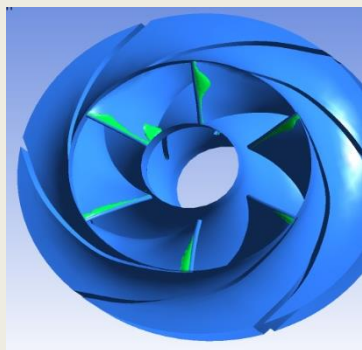
Structural analyze

Thermal analyze

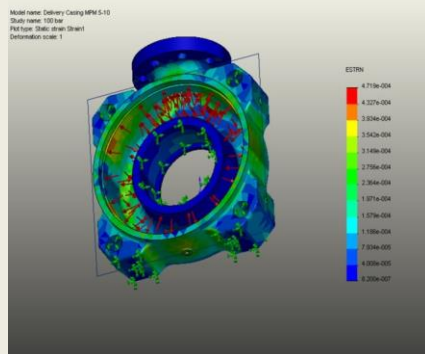
Fatigue analyze



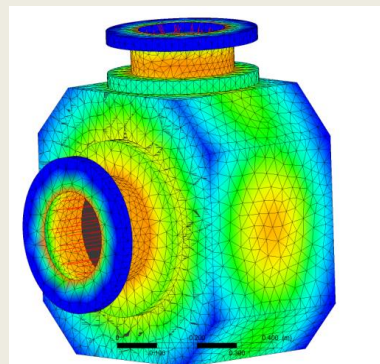
Machined diffuser



Cavitation analyze



Structural analyze



Thermal analyze



Flow analyze

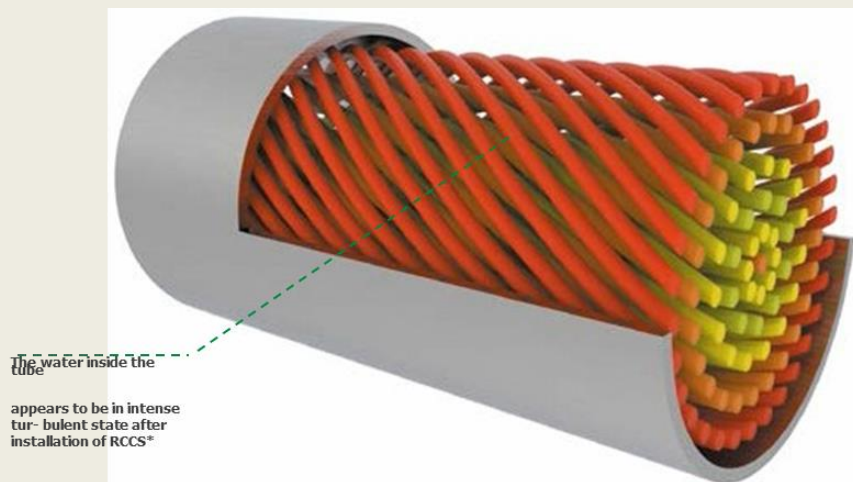
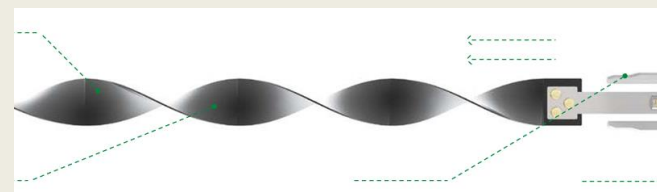
OPTIMIZED PUMPING SYSTEMS

PROJECT: OPTIMISATION OF PUMPS	COUNTRY	INSTALL POWER	ENERGY COSTS REDUCTION	Activity
		kW	%	
Chiller Pumps Rotana DUBAI	UAE	88	35	Regime optimization
Irrigation system	Saudi Arabia	135	31,8	Analyze of energy saving & consulting
MINE INDUSTRY SOUTH AFRICA	South Africa	30	4,6	Design, efficiency improvement
WATER SUPPLY SYSTEM VELIKA PLANA	Serbia	410	25.40%	Analyze of the energy saving, pump refurbishment
Personal references		kW	%	
Istrian Water Supply System	Croatia	425	40	
Istrian Water Supply System	Croatia	1.15	35	
Water Supply System Nova Gorica	Slovenia	65	45	
Paper and Cellulose Factory VIDEM	Slovenia	800	30	
Paper and Cellulose Factory VIDEM	Slovenia	1.2	20	
Water Supply System Rizana	Slovenia	330	25	
Water Supply System Rizana	Slovenia	260	25	
Water Supply System Postojna	Slovenia	1.25	60	
Water Supply System Ljubljana	Slovenia	900	25	
Water Supply System Ljubljana	Slovenia	1.7	25	
Thermo Power Plant Sostanj	Slovenia	1.575	50	
District heating System Saleska Dolina	Slovenia	350	35	
Thermo Power Plant Sostanj	Slovenia	12.8	6	

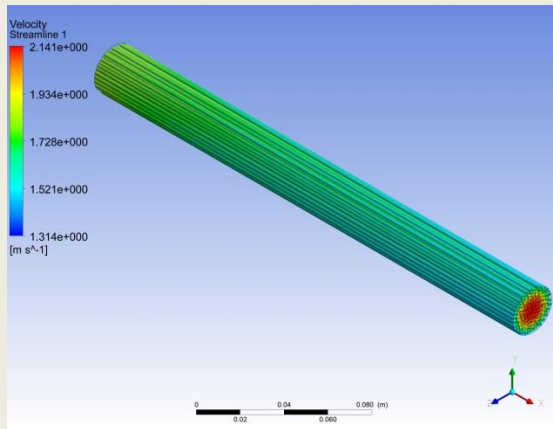
2. ENERGY SAVING IN THERMAL POWER PLANTS

Improving Enhanced Heat Transfer System

EFFICIENCY IMPROVEMENT OF HEAT EXCHANGERS
INCREASING POWER OF THERMAL PLANTS

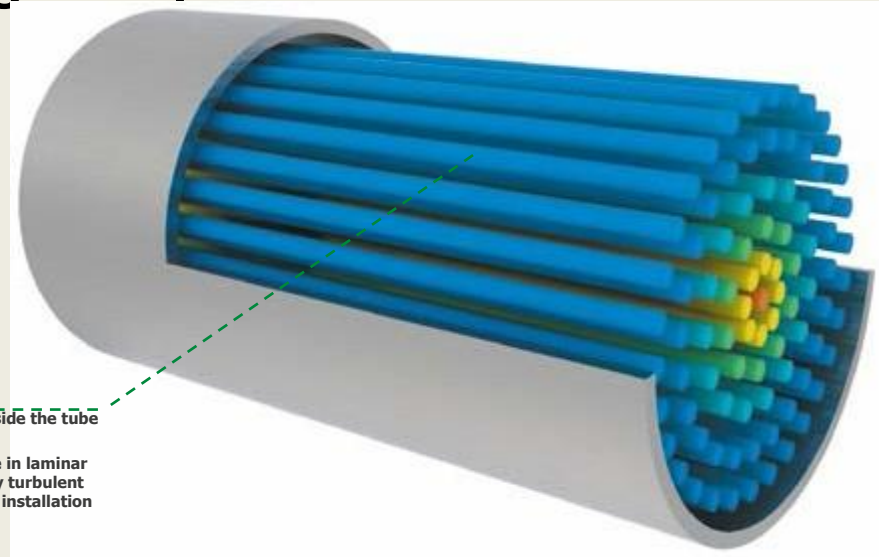


- Unique patented process solutions in the field of flow dynamics, improvement of heat transfer efficiency and application of new
- enhanced heat transfer coefficient and
- real-time cleaning of heat-exchanger equipment during the actually long-life operation



The water inside the tube

appears to be in laminar state (slightly turbulent state) before installation of RCCS*



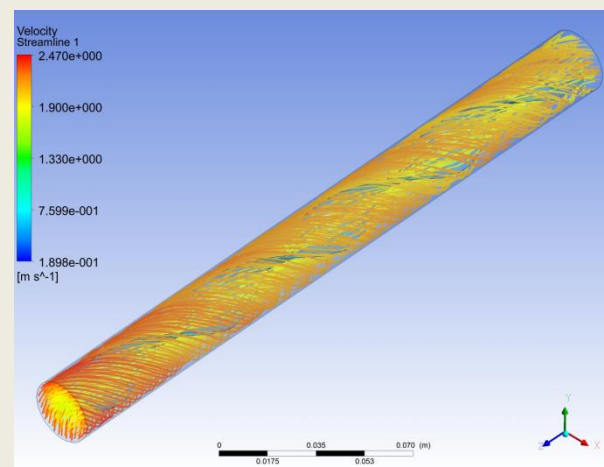
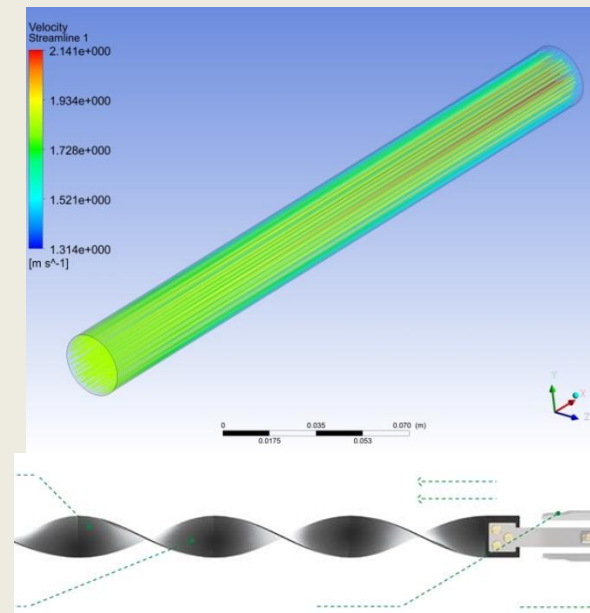
Example of Processed Data

EQUIPMENT HAVE NO IMPACT ON ENVIRONMENT,
EQUIPMENT COMPO- NENTS ARE NON-TOXIC AND HAVE NO
IMPACT ON WATER RESOURCES



Improvement of condenser efficiency by heat transfer by over 20%, maintenance of clean heat exchange tube condition.

If compared with rubber ball cleaning systems, the savings may amount to over 1.5 g/kWh of coil for a 600 MW generating unit, and over 2 g/kWh — for a 300 MW generating unit.



Application in Alternative Energy Generation

equipment is widely used in power plants, generating energy from alternative energy sources, including:

Blast furnace gas power plants, waste-based electricity production, coal powder and biomass fueled power plants, waste heat recovery plants of cement production facilities.

Application in Chemical Industry

This system is used in chemical industry, in particular, in evaporators and similar systems. System allows for prevention of coking, improvement of production rate and product quality and increase of equipment operational life.



- **Oil Refining**
- **In different processing technologies of**
- **oil refining industry, the heat exchanger**
- **fouling and corrosion often result in**
- **reduction of production rate**
- **and product quality.**
- **This technology prevents from**
- **deposit formation and chemical**
- **corrosion, providing for increase**
- **of equipment operational life and**
- **considerable reduction of**
- **maintenance costs.**

