



Financial Considerations

Depending on the plant size optimization of the excess air alone could lead to a reduction of fuel costs of over € 500.000 per year

- use of economical coal
- reduced NH₃ consumption for the fuel gas purification in hard coal combustion systems
- reduced internal consumption
- longer maintenance intervals
- optimized soot blowing cycles
- reduction of boiler wall corrosion through minimization of the CO-content
- reduction of slagging through optimized air distribution.

The Results

NO_x
up to
25%
down

UBC
up to
40%
down

Efficiency
up to
1%
up



ORFEUS Combustion
Engineering GmbH
An der Pönt 53a
D-40885 Ratingen, Germany
Tel. +49 2102 9974-0
Fax +49 2102 9974-41

A proud member of the DURAG Group of Companies

Combustion Optimization for Coal Fired Power Plants

*Solutions for Emission
and Combustion* **DURAG
GROUP**

**Save up to
€ 500.000
per Year!**

The **PATENTED** Way: Patent # 0 802 372 B1

www.durag.de

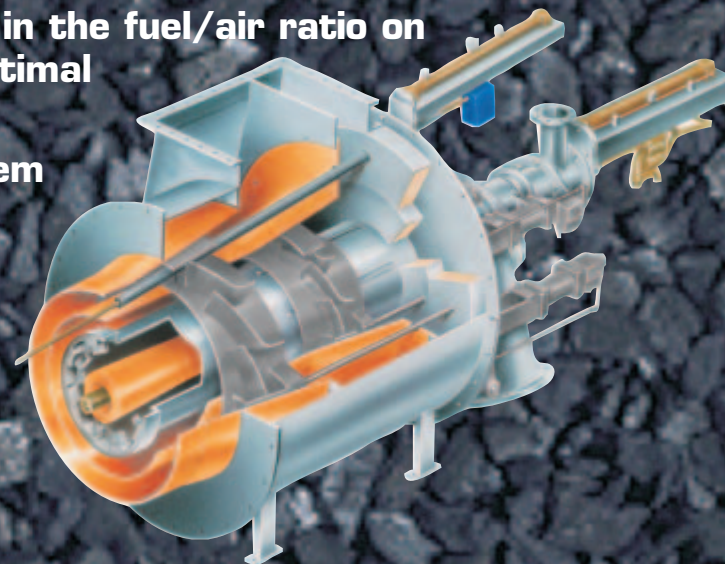
Why ORFEUS Combustion Optimization

- There is increasing competitive pressure on power plant operators to improve their plants' economic efficiency.
- The conventional way of viewing the combustion chamber does not provide the data needed for a burner specific optimizing strategy.
- The ORFEUS view on individual flames bears the highest possible degree of information such as the air/fuel ratio, changing coal qualities, clogging and pollution, tilted flames etc.
- Modern sensor technology, combined with advanced optimizing software is implemented into an online control system.

Non-optimal Combustion

The following factors lead to a change in the fuel/air ratio on the burner and consequently to non-optimal combustion:

- coal transport problems in the system
- coal mill problems
- varying coal quality
- unfavourable distribution of coal dust in the system
- ignition problems.



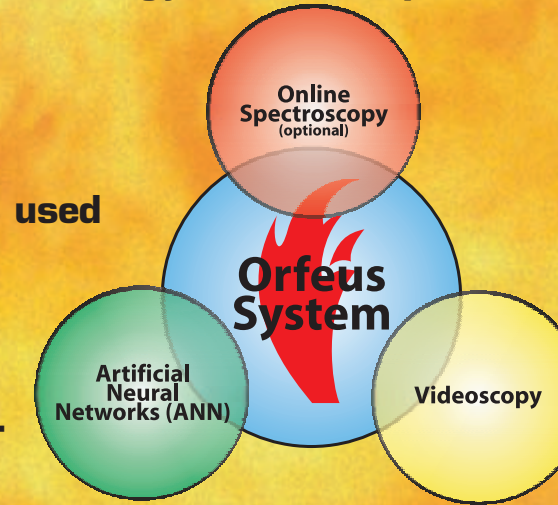
The ORFEUS System

Based on the online analysis of the combustion process the ORFEUS Optimization System develops an optimization strategy with an emphasis on

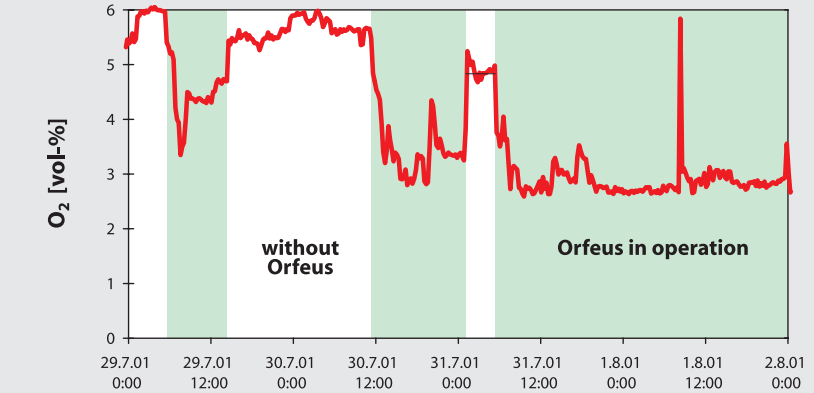
- efficiency improvement
- emission reduction
- minimization of material stress

A combination of the following components is used

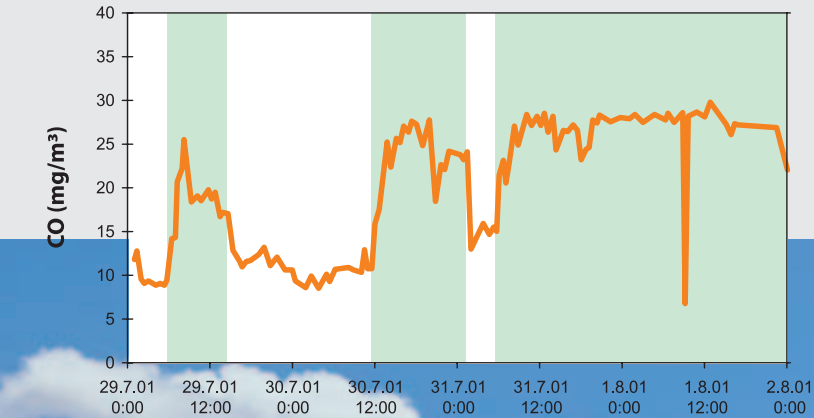
- video monitoring with image processing
- optional online spectroscopy
- optimizing software based on an artificial neural network (ANN), fuzzy-logic and classic modelling.



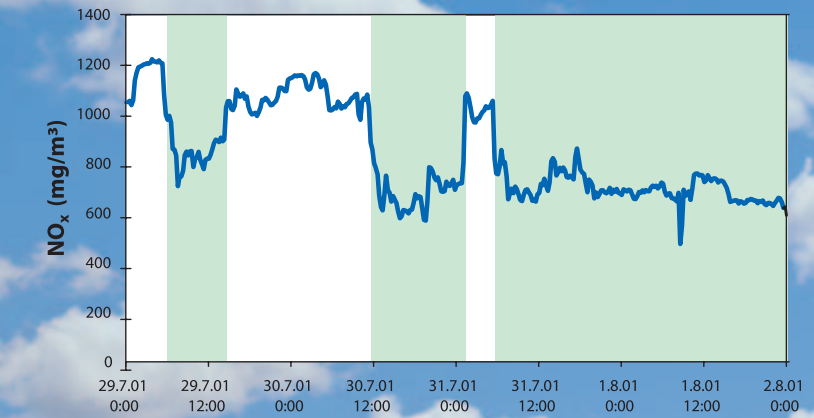
Practical Examples



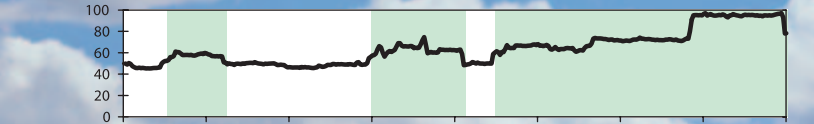
Reduction of O₂ level in the flue gas



CO content in the flue gas



Reduction of NO_x in the flue gas



Load

The Strategy

The diagram on the right shows the result of the optimization strategy „efficiency increase of the combustion process“ whilst fulfilling the specifications - primary NO_x is always to be minimized, CO is not to transgress a fixed limit and the total air quantity is to be minimized as well.

