

# System Operation Made Transparent: SES System Efficiency Services





A large, glowing neon sign spelling 'Fluid Future' in a cursive font, mounted on the glass facade of a modern building at dusk.

We are an innovative supplier of pumps, valves and systems. And because energy efficiency is everyone's business, we at KSB have developed a comprehensive concept we call "Fluid Future". First and foremost, it aims to optimise your plant's overall efficiency. To make that reality, we've developed five modules which help you achieve savings right through the life cycle of your pumps and valves.

**One of the modules of this energy efficiency concept is system analysis.**



#### SYSTEM ANALYSIS

Our experts analyse your system and show where you can save energy – with SES System Efficiency Services or PumpMeter.

## To keep a system running, you have to know it inside out.

A pump is a complex component in a larger system. Improvements in energy efficiency come from lots of small details, but the focus always has to be on analysis of the overall system. That is just as true of existing plants as of new designs. Careful examination of the pump's load profile is required both under current operating conditions and with a view to future demands. The aim is to identify savings potential both today and tomorrow, and then achieve those savings in a comprehensive systems approach. Doing that requires years of experience.



**“Recognising the smallest details in highly complex systems and processes requires transparency. I’m here to provide it.”**

**Dr. Falk Schäfer,  
Head of SES System Efficiency Services**



Further information is available at [www.ksb.com/fluidfuture](http://www.ksb.com/fluidfuture)

# Increasing system profitability through comprehensive system analysis

No matter what the sector – Energy, Industry, Water or Waste Water – the actual load profile of the pump is recorded within the scope of comprehensive system analyses and compared with the design conditions. This helps identify potential savings (energy efficiency analysis) and detect the cause of failures (damage analysis).

In this way you can also respond to the challenges posed by current legislation on reducing CO<sub>2</sub> emissions and ever-increasing energy costs.

## Overview of SES System Efficiency Services:

- Energy efficiency analysis
- Damage/failure analysis
- Documentation including action plan
- Implementation of technical measures on the pump and system
- Follow-up of optimisation by second measurement, free of charge

A data logger simultaneously records process and vibration values at the site. Those enable us to identify the pump's current load profile and compare it with the specifications.

Then we can recommend action to maximise energy efficiency and ensure that your pumps and systems run economically.



Data logger

### Process variables to EN ISO 9906

- Pressure
- Temperature
- Power
- Flow rate
- Rotational frequency
- ...

### Vibration values to DIN ISO 10816-7

- Vibration velocity
- Frequency analysis

» Turn the page to see System Efficiency Services in practice.



#### **A new, additional option of system analysis:**

Our innovative PumpMeter increases the transparency of pump operation. PumpMeter measures all of the pump's key data and makes it available via an easy-to-read display. This allows you to keep track of the current operating point, and, over time, a precise load profile of your pump is generated. System analysis helps identify potential energy savings, enabling you to significantly lower your energy costs. This way you can increase energy efficiency and keep your pump running and running.



[www.ksb.com/fluidfuture/pumpmeter](http://www.ksb.com/fluidfuture/pumpmeter)



Etabloc with PumpMeter



#### Costs saved by SES

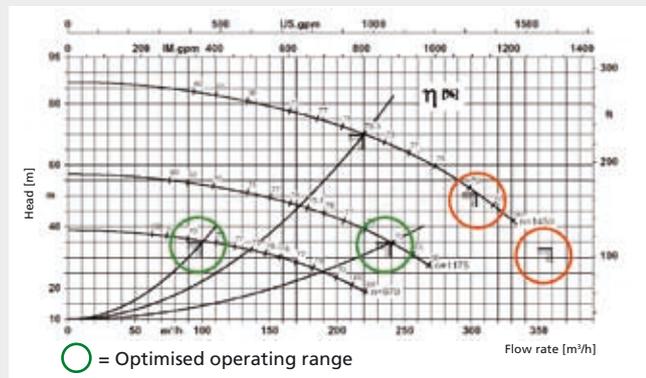
Energy costs per annum prior to optimisation	€ 20,702
Energy costs per annum using speed control	€ 7,394
Savings per annum	€ 13,308
Costs for the variable speed system	€ 40,267
Payback period	3.03 years
Energy saved	133,000 kWh
Reduction of CO <sub>2</sub> emissions	83 tonnes

## Aluminium rolling mill

Energy savings of more than 60 percent result from increasing the energy efficiency of cooling lubricant pumps. These volute casing pumps serve to transport cooling lubricant to a rolling mill.

#### Outcome of SES System Efficiency Services

- Identification of the actual, previously unknown demand
- Change from parallel to single-pump operation
- Use of a Hyamaster speed control system



#### Costs saved by SES

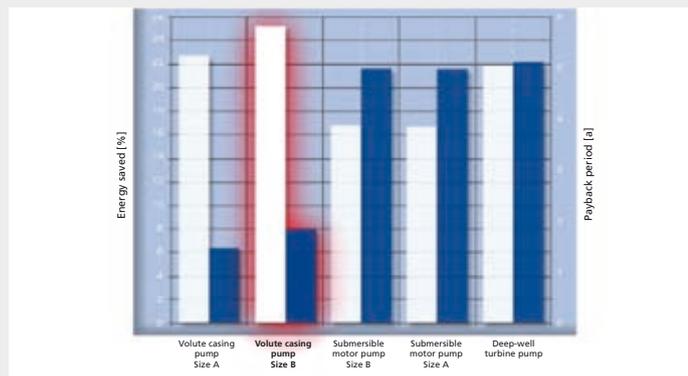
Energy costs per annum prior to optimisation	€ 39,420
Energy costs per annum using speed control	€ 29,422
Savings per annum	€ 9,978
Costs for two new pump sets	€ 18,406
Payback period	1.84 years
Energy saved	100,000 kWh
Reduction of CO <sub>2</sub> emissions	62 tonnes

## Cooling water circuit of a chemical plant

Energy savings of more than 20 percent result from increasing the energy efficiency of cooling water pumps. These tubular casing pumps circulate cooling water in a closed circuit.

#### Outcome of SES System Efficiency Services

- Time of operation at specific operating points: 90 percent of the operating time the operating point of the cooling water pump is at 300 m<sup>3</sup>/h, only 10 percent of the time fire-fighting operation is required at 400 m<sup>3</sup>/h
- Use of two fully redundant pumps with enhanced efficiency





#### Costs saved by SES

Energy costs per annum prior to optimisation	€ 783,867
Energy costs per annum after installation of blind stages	€ 576,872
Savings per annum	€ 206,994
Modification and machining costs	€ 134,500
Payback period	0.65 years
Energy saved	4,247,000 kWh
Reduction of CO <sub>2</sub> emissions	2,640 tonnes

## Combined cycle power station

Energy savings of more than 25 percent result from increasing the energy efficiency of boiler feed pumps. These high-pressure ring-section pumps serve to circulate the boiler feed water.

#### Outcome of SES System Efficiency Services

- Identification of changed demand based on new system conditions: the pump generates excessive head
- Installation of 2 blind stages in the existing pump – pump operation has become more energy-efficient, thus reducing energy costs



Costs saved by SES	Pump 1	Pump 2
Energy costs per annum prior to optimisation	€ 11,648	€ 12,996
Energy costs per annum for both new pumps	€ 8,878	€ 8,960
Savings per annum	€ 2,770	€ 4,036
Costs for two new pumps	€ 13,950	
Payback period	2 years	

## Waste water pumping station

The aim was to determine the cause of extreme pump vibration, which had repeatedly led to pump failure. The submersible motor pumps serve to transport waste water from an inlet tank.

#### Outcome of SES System Efficiency Services

- Connection detected between the fill level in the inlet tank and the vibration excitation – Result: severe damage to the bearing bracket of the pump caused by gas being transported with the fluid in the intake area
- Installation of a curtain wall in the inlet tank to separate any entrained gas improved pipe fastening and increased submergence in the inlet tank.

