A ROCS Case Study: Atlas Power Plant in Pakistan
Radiator optimization of the cooling system

Atlas power plant in Lahore
ROCS (Radiator Optimization of the Cooling System) was designed to deliver maximally efficient cooling capacity in any operating environment. Conditions at the Atlas power plant in Lahore are sure to be among the most severe in the world.

This 225 MW diesel combined cycle power plant with a life cycle efficiency above 45% has been in operation since the first half of 2009. MAN PrimeServ is fully responsible for the operation and maintenance of this plant.

Key data of the power plant
- Installed diesel engine power 11 x 18,900 kW
- Total net capacity 213.6 MWe
- Life cycle efficiency ≥ 45%

Severe climate condition
In the hot semi-arid steppe climate of Lahore, peak summertime temperatures regularly exceed 40°C. There is no better environment for testing the efficacy of ROCS. Soon after the system was commissioned it became clear that even under the severe conditions in Lahore, the system achieves spectacular energy savings.

Power savings up to 1,500 kWh
By using the MAN PrimeServ’s Online Service tool we have been continuously monitoring the engines of the power plant, gathering data and analyzing performance. The measured results speak for themselves. The above shown chart compares the two periods: before installing ROCS (manual operation) and after the installation (automatic operation). The chart clearly illustrates how the auxiliary power input could be reduced from 190 to 130 kW after the installation of ROCS. That means quite a remarkable average auxiliary power saving of approximately 1,500 kWh per day per diesel engine has been achieved by ROCS.
An Easy Retrofit that Increases Profits
Plant efficiency boost with accelerated ROI

Many plant owners focus on plant efficiency as the only opportunity to improve their bottom line. From our overall organization’s unique perspective as plant operators, builders and service company, we have always had a broader perspective on where extra profit may come from.

ROCS was born out of the realization that a huge opportunity exists outside of simply optimizing engine efficiency. In significantly reducing the auxiliary power consumption of the plant, overall efficiency gains can be dramatic.

ROCS is a retrofit product installed at the cooling system of an engine. It optimizes the rotational speed of the radiators’ fan motors, which results in significant energy savings by lowering the power consumption of the plant auxiliaries. As a result the overall efficiency of the plant is improved and this retrofit quickly provides payback!

ROCS installation and equipment
A ROCS retrofit comprises the following components:
- ROCS control cabinets (electrical panels)
- Sensor (automation equipment)
- Cabling (sensor cables and shielded power cables)
- Diffuser (integrated with fan outlet, optional)
- Online service (remote monitoring)
- Project engineering and commissioning (plant-specific adaptation)
- Shack (small air-conditioned housing, optional)

Failure and maintenance procedures
In case of a temperature sensor failure, the ROCS’ control system automatically starts operating the fans at standard 100% fan speed and the operator receives a breakdown alarm. In the event of a control unit or fan motor failure, the operator also receives a breakdown alarm. The other fans continue to operate.
It’s Your Energy. Don’t Waste it, Sell it.
The benefits of radiator optimization of the cooling system

Use less, sell more
Radiator fans consume a considerable amount of the power you produce at your plant. What if you could change that? Ultimately, ROCS is about a very straightforward calculation. Since your plant powers itself, all the energy you do not use yourself is energy which can be used otherwise. ROCS implementation goes straight to the bottom line with typical payback times of around one to two years.

Customer’s benefits
- Substantial energy savings
- Increased output
- Payback typically over one to two years
- An easy retrofit for any plant
- Simple fallback to original operation
- E-motor friendly power ramp-ups

Smart cooling
ROCS (pending patent application) will automatically control the speed of the radiator fans to a level optimally adjusted to ambient air temperature. As the air temperature drops, ROCS will automatically slow down the speed of the fan motors. Fan speed is never higher or lower than the ideal speed for the safe and efficient operation of the engine. MAN PrimeServ engineers will configure ROCS to the specifications of your plant.
Automatic Radiator Control
Efficient and accurate cooling

How it works
In essence, a radiator system comprises a fan, which is driven by an electric motor, and tubes in which cooling media circulate.

The figure above illustrates the working principle of radiator cooling.

1. Cooling water enters the combustion engine.
2. It cools the engine system by absorbing its heat.
3. Now warmer, the coolants return to the radiators.
4. The coolants pass through the radiators in cooling tubes. Rotating fans create an airflow which absorbs the heat of the coolants.
5. The ambient temperature has a strong impact on the cooling effect of the radiator system. At low ambient temperatures, the air flow can be reduced.
6. In power plants, the control of air flow can often be optimized.
7. Using ROCS means replacing manual processes by full automatic control which optimally and immediately adapts to changes in the ambient temperature and thus saves significant amounts of energy.
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