About Sasol

Sasol is an international integrated energy and chemical company that leverages the talent and expertise of more than 34,000 people working in 37 countries. The company develops and commercializes technologies, building and operating world-scale facilities to produce a range of product streams, including liquid fuels, high-value chemicals and low-carbon electricity.
Challenge

In December 2012, Sasol New Energy, a subsidiary of the international petrochemical company, switched on its new gas engine electricity generation plant in Sasolburg, South Africa. The Sasol Gas Engine Power Plant (SGEPP) is the largest plant of its kind in Africa. It is powered by 18 Wärtsilä gas engines with an installed capacity of 175 megawatts (MW), using natural gas as feedstock. This same year, the South African electricity public utility, Eskom, introduced a system of opportunity for independent electricity producers, such as Sasol, to sell excess capacity on a short term basis. This provided impetus for Sasol to demonstrate its position as a low-carbon power producer in South Africa by contributing power to and easing pressure on the national grid.

However, Sasol’s Gas Engine Power Plant requires maintenance at very specific service intervals in accordance with the asset management plans. The duration of each maintenance interval is also dependent on the type of service being performed. Starting all 18 engines at the same time, for instance, resulted in the service schedules of all the machines coinciding. This would require a large number of maintenance teams during these service periods, but Sasol alone has one core maintenance team available. Therefore, the company required a solution to optimize the existing maintenance schedule of its Gas Engine Power Plant in order to successfully increase its availability.

Solution

The Decision Support Group of Sasol Technology was tasked to develop an application to optimize the schedule for operating the gas engines. The difference in the duration of the shutdown periods for the various service intervals made it absolutely necessary to optimize the schedule over fairly long term periods (two years or more). This long term view, combined with a mixed integer scheduling problem, formed a large problem size that would require a powerful solver. Because this application would require multiple runs by laypersons, a user friendly human interface was also necessary.

AIMMS provided an ideal solution: a powerful multi-solver optimizing tool with a configurable and adaptable user interface, capable of creating powerful user friendly applications. With the help of ORTEC, an international consulting group and long-standing AIMMS partner, Sasol managed to bridge their AIMMS experience gap and developed an application to create and optimize a schedule for the gas engines.

Results

- Increased electricity production during winter months by 4.6%
- Increased operational capacity, easing pressure on the national grid during key months
- Increased ability to meet demand
- Adherence to service intervals
- Optimal use of maintenance team

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<th>Asia Pacific</th>
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<td>+1 425 458 4024</td>
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About AIMMS

The AIMMS Prescriptive Analytics Platform helps you evaluate and identify the best options to tackle your most pressing challenges with sophisticated analytics that leverage mathematical modeling and scenarios while pulling from multiple data sources. You can immediately gauge, not just what is likely to happen, but what you should do about it for the best possible outcome. Whether you seek to improve your strategy, planning, operations or transform your entire supply chain, AIMMS software is the ideal combination of being tailored to your unique situation paired with speed to value (ROI). That’s why teams at Shell, Johnson & Johnson, GE and Heineken and many more fire up AIMMS every day.

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