Peaking power

> Case History
Angaston Power Station, Australia

Cummins Power Generation

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Where:
Angaston Power Station, Barossa Valley wine country, South Australia

What:
50 MW diesel peaking plant featuring 30 QSK60 generator sets with selective catalytic reduction (SCR) aftertreatment to reduce NOx, in sound-attenuated buildings to reduce noise

Purpose:
To help support the Australian power grid during times of high peak demand or power emergencies

Primary choice factors:
Cummins Power Generation provided a low-emissions, sound-attenuated turnkey solution that included ongoing operation and maintenance

Cummins Power Generation peaking plant is the toast of the Barossa wine country

ANGASTON, AUSTRALIA — The largest and cleanest diesel power station built by Cummins Power Generation Inc. in South Australia's Barossa Valley is meeting critical low-emissions performance targets. The power station's ultralow emissions are required due to the location of the plant in the heart of the Barossa Valley, a premier wine-growing region where some of the world's best red wines are produced. The $40 million peaking facility, which can generate up to 50 MW, is connected to the national electricity grid and operates only when market demand or pricing is very high.

"The location of the plant in such an environmentally sensitive area demonstrates how far we've come in emissions control for a diesel power station," says Joe Loughrey, president and CEO, Cummins Inc., who was on a recent tour of the facility. "It certainly demonstrates our leadership in emissions technology."

The unmanned Angaston peaking plant features 30 Cummins Power Generation QSK60 generator sets that can start up, synchronize and be online generating 50 MW of power in less than two minutes. The plant was originally built with a 40 MW capacity and then expanded to 50 MW late in 2006.

The team from the Cummins Power Generation Energy Solutions Business unit visited the power plant recently with Cummins Inc. president Joe Loughrey (center).

The plant's 30 QSK60 generator sets from Cummins Power Generation can start up, synchronize and be online providing 50 MW in less than two minutes.

Reliable in high ambient temperatures

"The ability of the plant to quickly reach full capacity in all conditions is critical, especially when the wholesale market price for electricity can spike at $10,000 per megawatt-hour," says Tony Blaubaum, general manager of Cummins South Pacific's Energy Solutions Business unit. "Just recently, the power station hit its maximum 50 MW capacity for the first time when brush fires caused a major breakdown of the electricity network. The temperature at the Angaston site actually reached 50 degrees C (122 degrees F), which confirmed the ability of the power station to operate at its maximum capacity even in very high ambient temperatures."

The engine used on the generator sets is the big V-16, 60-liter Cummins QSK60 diesel, rated up to 3,000 horsepower. This engine uses a platform similar to the QSK60 diesel engines that are used in some of the world's largest mining haul trucks and excavators. The engine on the 1.6 MW generator set features a cooling system that is designed for high efficiency even in searing heat — a key feature of its reliability.

Emissions and noise reductions

The generator sets at Angaston achieve their low emissions by using SCR technology to treat the exhaust gases. SCR technology uses a urea spray and catalysts to convert oxides of nitrogen (NOx) emissions into nitrogen gas and water vapor, both harmless components of the atmosphere. The treatment reduces NOx in the exhaust by up to 98 percent, making the station one of the cleanest fossil fuel power plants in Australia.

In addition to producing very low emissions, the generators are also very quiet. To limit the maximum noise level to only 45 dB(A) at the nearest residential property line, the units are housed in special sound-attenuated buildings.

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Although Cummins Power Generation operates and maintains the power station, it is owned by Infratil, a New Zealand-based company that invests in infrastructure and utility assets. Infratil also owns airports in New Zealand and Europe as well as electricity and waste-to-energy investments in New Zealand and Australia. The company also owns another power station that was designed and built by Cummins Power Generation in the Adelaide suburb of Lonsdale. This 20 MW station, which continues to be operated and maintained by Cummins Power Generation, won a prestigious award for environmental excellence from the Institution of Engineers Australia.

"The Angaston power station was a very demanding and complex project requiring the expertise of a team of engineering and project personnel from Cummins Power Generation and its Energy Solutions Business unit in Australia, headed up by Anthony Mitchell and David Sheldon," Blaubaum concludes.

For more information about peaking power systems or other energy solutions, contact your local Cummins Power Generation distributor or visit www.cumminspower.com/energysolutions.

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