



Standby power

> Case History

Channel 7, Telstra Dome, Melbourne

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**Power
Generation**

Where:

Seven Network, Telstra Dome, Melbourne

What:

Standby power for the Seven Network (Channel 7) digital broadcasting center with export link to electrical grid

Purpose:

Reliable source of emergency power to allow Seven Network's broadcasting to continue without disturbance; export link to Melbourne's CBD

Primary choice factors:

Cummins Power Generation's ability to provide total contract management of the project

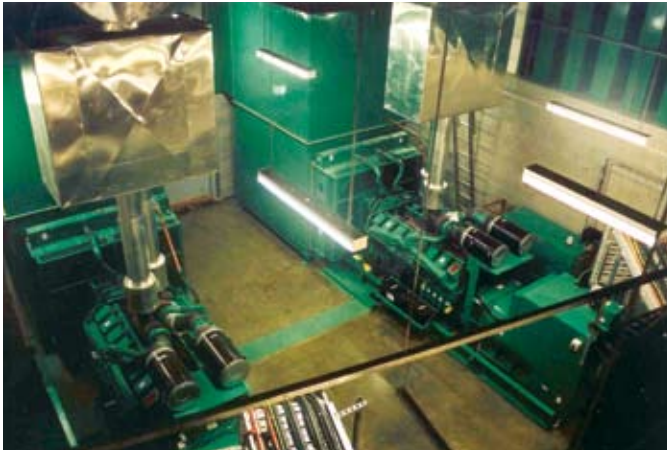
Cummins on standby for Channel 7 ... and Melbourne's CBD

MELBOURNE, AUSTRALIA — A project to supply standby power to the new Seven Network (Channel 7) digital broadcasting center in Melbourne suddenly took on much greater scope for Cummins Power Generation with the decision to connect the two generator sets to the main CitiPower electrical grid.

CitiPower, Melbourne's CBD power supplier, saw the opportunity to further improve reliability of electricity supply during the summer months when air-conditioning creates a high demand.

Cummins Power Generation's contract management of the project included the supply and installation of the generators, noise and emission control measures, installation of three reactors, and myriad procedures that required working closely with all parties — building and electrical contractors, Seven Network project staff, and project consultants Norman Disney & Young (NDY).

In conjunction with CitiPower's engineering staff and consultants, Cummins Power Generation was also responsible for the design, supply and installation of the export paralleling link.



The generator room features comprehensive noise and emissions control.

System operation

The two diesel generators are 1120DFLC units using Cummins KTA50 engines, producing two megawatts of 240/415-volt power in the event of mains failure or grid exporting. Fuel supply of 22,000 liters allows 40 hours of continuous operation.

A Cummins Power Generation (DMC300/2N) master control system incorporating a paralleling switchboard is also installed. In standby mode, when the DMC300/2N senses a power failure, both generators start up, attain full speed and power, and synchronize in less than 10 seconds. The main switchboard at the Seven Network then transfers from mains power to emergency.

In export parallel mode, both generators, initiated by CitiPower, will start, parallel and then synchronize with the utility mains. The export circuit breaker installed in the Cummins Power Generation switchboard then closes, the generators ramp up to two megawatts and transfer this power from the generators into the main CitiPower utility grid.

The Seven Network also has access to the generators for 30 minutes of testing each week and exports the power generated during these test periods to offset its own power usage cost with CitiPower. The export connection to the CitiPower grid saved the Seven Network considerable money on installing load banks for this testing.

The three single-phase 25 milliohm fault limiting reactors were installed in series with the generators and Seven Network substation to limit faults. The potential fault level if a short circuit occurs in the grid system or substation can be in excess of 20,000 amps (20 kA).

Extensive testing

During commissioning of the generators by Cummins Power Generation, extensive testing was required to prove system efficiency to the Seven Network, CitiPower and consultants NDY.

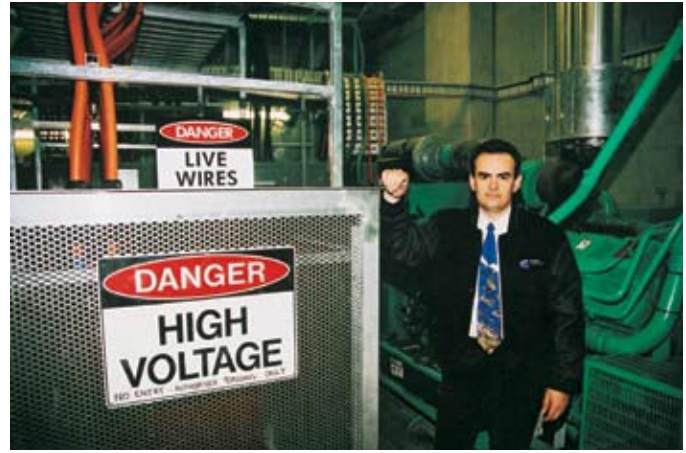
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F-1969 Rev. 4/08 (2003)



Original testing was scheduled for 72 hours at full load; after 42 hours, all parties were convinced of the reliability of the power system.

"We were asked to run the generators for 72 hours at full load," says Adam Ferrara, power generation contracts manager based at Cummins Laverton. "However, after 42 hours of operation and the successful completion of transient, harmonic and integration testing, the Seven Network and NDY were convinced of the reliability of the generator system and agreed to conclude the testing."

Thermal imaging of the Cummins Power Generation paralleling switchboard was also part of the test program to prove there was no overheating of bus work or connections in the switchboard. The imaging, which reveals hot spots, was carried out after the generators had been running for 24 hours.

"Thermal images were taken of the two KTA50 engines after they'd run for 24 hours — the last five hours at 100 percent load — and the cooling systems were shown to exceed specifications."

Noise, emission and exhaust control

The generator room at the Seven Network features comprehensive noise and emissions control. Specifically, the air intake and exhaust discharge systems are acoustically designed and built to reduce the noise level to only 65 dBA at one meter. This is imperative, as the TV studios and staff dining room are directly above the generator room.

The exhaust systems also incorporate self-cleaning soot filters that remove up to 90 percent of particulates, while acting as catalytic converters to significantly reduce carbon monoxide and hydrocarbons. These components and the mechanical installation work were supplied by a Cummins Power Generation delivery partner, Exhaust Control Industries (ECI).

For more information about integrated standby power systems, contact your local Cummins Power Generation distributor or visit www.cumminspower.com.

