



Standby power

> Case History
Mass Rapid Transit, North East Line, Singapore

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Where:
Mass Rapid Transit, North East Line, Singapore

What:
Sixteen Cummins Power Generation gensets with QST30G3 engines, 10 Cummins Power Generation gensets with QST30G4 engines, one Cummins Power Generation genset with KTA50G1 engine and one Cummins Power Generation genset with KTA50G3 engine

Purpose:
To provide backup power for 14 of the 16 stations in the North East Line, which also serve as emergency public shelters

Primary choice factors:
Product reliability, previous Cummins track record with the Mass Rapid Transit system in Singapore, suitability of the product for emergency, heavy-duty applications

Cummins Power Generation standby power for world's first fully automated Mass Rapid Transit (MRT) system in Singapore

SINGAPORE — The island republic's third Mass Rapid Transit (MRT) line, the US \$5 billion North East Line (NEL), is the first driverless, heavy metro system of its kind in the world. The NEL began running in June 2003 with 14 of its 16 stations in operation. The operator, SBS Transit, will open the remaining two stations at a later date.

The decision to build the NEL was made in January 1996. It took five years of intensive effort by project teams under the Land Transport Authority before it was completed at the end of 2002. The construction of some of the stations proved to be a formidable challenge. The NEL is the first major extension of Singapore's main MRT network that was completed in 1990. The 20-kilometer long NEL runs from HarborFront in the South, to Punggol in the North East, entirely underground.

The operation of the NEL is facilitated by about 500 different computer systems that communicate with one another to ensure the smooth running of the trains. With the help of the Integrated Supervisory Control System, well-trained staff at the Operations Control Center (OCC)



A special override protection feature in Cummins Power Generation gensets ensures continuity of power supply.



Cummins Power Generation gensets provide reliable and critical backup power supply to NEL underground stations.

in the Sengkang NEL headquarters monitor and control computer systems on the trains, along the tracks and at the stations.

The OCC communicates with station computers through a fiber-optic network, including those for signaling, power control, train-borne functions, fire detection, electrical services, elevators and escalators at the stations, communications systems, and video camera systems in the trains and at the station platforms.

The train line is probably an excellent model for other countries that aspire to build their own seamless and efficient MRT systems. However, everything works for the NEL only when there is a reliable and uninterrupted power supply.

Singapore's MRT system has been using Cummins' proven power generation products since its first line went into operation in 1990.

For the NEL line, 16 Cummins Power Generation gensets, each powered by a QST30G3 engine and rated at 939 kVA, have been installed at eight of the stations (two gensets in each station), and 10 gensets, each powered by a QST30G4 engine and rated at 1,000 kVA, have been installed at five other stations (also, two gensets in each station), to provide standby power. Furthermore, one Cummins Power Generation genset powered by a KTA50G1 engine and rated at 1,000 kVA and one Cummins Power Generation genset driven by a KTA50G3 engine and rated at 1,256 kVA provide backup at another station. In summary, 14 of the 16 stations are backed up by Cummins Power Generation gensets.

A special design feature of the Cummins Power Generation gensets supplied for the North East Line is the override protection function. Generally, engines are protected by sensors monitoring the engine temperature and oil pressure,

to avoid damage. If the limits to high engine temperature, low oil pressure and high exhaust temperature are crossed, alarms will be raised, causing a shutdown of the gensets for the situation to be rectified. In the North East Line, this protection can be overridden by a designated switch on the control panel to ensure continuity of power supply.

"Cummins Power Generation was up to the task for this project, with its quality of product and technology, and the experience gained from supplying standby gensets for other MRT lines in Singapore," Mr. Tan pointed out.

Thirteen of the North East Line stations have been hardened to serve as underground emergency public shelters. The Cummins genset application at these stations fully complies with the specifications through the provision of impact-resistant, special shock mounts at the base of the gensets.

"The highly aesthetic station designs, the proximity of several of the stations to urban developments such as shopping complexes, and the barrier-free features benefiting both the able-bodied and the physically challenged, encourage large numbers of people from a cross-section of the population, to travel on the NEL. This further underlines the importance of the power supply, as well as the backup systems, particularly in the stations," said Mr. Nick Tan from Cummins Power Generation, Singapore.

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

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