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ABB to provide innovative traction power solution for UK railway network

ABB has won a \$20 million contract from Network Rail to provide a trackside power electronics solution for new high-speed electric trains

The UK's main rail link between London and Edinburgh is the East Coast Mainline (ECML). Network Rail, which owns and operates the rail infrastructure, is preparing for the introduction of the new 125 mph Hitachi InterCity Express Trains, which are expected to start passenger services from 2018. The new trains are capable of running on both diesel and electric power. However, one section, near Doncaster, needs additional traction power for both the main track and Hitachi's new state-of-the-art depot that will serve the new rolling stock.

To run on electricity, these trains will need around three times more power than is currently provided by the existing supply. A conventional solution is to construct a new high voltage grid connection, which can be costly and takes time to install. Instead, ABB has developed a Static Frequency Converter (SFC) solution that will adapt the feed from the existing Northern Powergrid local distribution network, at an estimated total cost saving of 60 percent compared with building a new high voltage grid connection.

In most cases, an SFC is installed to interconnect power networks operating at incompatible frequencies. A typical example is when a cruise ship with an on-board network operating at 60 Hertz (Hz) needs to plug into a port where the on-shore power network runs at 50 Hz.

In the case of the Doncaster ECML, the SFC will not be converting the network frequency. Instead, it will convert the three-phase supply from the local distribution network (at 33 kilovolt) to the single-phase trackside supply required by the trains (at 25 kilovolt). ABB will deliver the complete SFC solution for Network Rail including the power electronics, transformers, switchgear and cabling. The contract was awarded in the second quarter of 2017.

"The Doncaster ECML project is a great example of how smart solutions can result in reduced connection costs for railway projects," says Patrick Fragman, head of ABB's Grid Integration business, a part of the company's Power Grids division. "It also shows that innovation is not always about new technology. In this case, we are using tried and tested SFC technology in a way that could be applied to many similar projects requiring electrification solutions to upgrade existing rail networks."

ABB installed a similar SFC application to upgrade a feeder station at the Wulkuraka rail depot in Brisbane, Australia, to ensure sufficient traction power supply and support Queensland Rail's expansion plans for its southeast region.

ABB (ABBN: SIX Swiss Ex) is a pioneering technology leader in electrification products, robotics and motion, industrial automation and power grids, serving customers in utilities, industry and transport & infrastructure globally. Continuing more than a 125-year history of innovation, ABB today is writing the future of industrial digitalization and driving the Energy and Fourth Industrial Revolutions. ABB operates in more than 100 countries with about 132,000 employees. www.abb.com

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