



Rail power
ABB UPS for the world's largest
railway construction project



Nicole Nägele, Kevin Bickerstaffe – ABB is supplying uninterruptible power supplies (UPSs) to the North-South Railway (NSR) project in Saudi Arabia – the world's largest railway construction undertaking. This mammoth enterprise will see a 2,400 km passenger and freight rail line built from Riyadh to Al Haditha, near the border with Jordan. ABB PowerWave 33 and PowerScale UPSs will support all IT, ticketing, telecom and surveillance systems at five stations as well as at the new passenger station in Riyadh. ABB UPSs will also protect the traffic control center. Commissioning will be completed during 2014.

The North-South Railway (NSR) project in Saudi Arabia is not only the world's largest railway construction but also the longest route to adopt the European train control system (ETCS) to date. It is a 2,400 km passenger and freight rail line that runs from the capital city Riyadh, in the northwest of the country, to Al Haditha, near the Jordanian border.

Due to its strategic importance to the national economy, the North-South Railway has been given priority over the other projects. It is an integral part of the planned phosphate and bauxite mining work in the northern region of the country, where these ores are available in commercial quantities. They can be exported from the processing facilities at Raz Az Zwar on the Gulf coast. When finished, this new infrastructure will make Saudi Arabia the second-largest exporter of minerals in the world.

North-South Railway project

The 2,400 km single-track, North-South Railway project involves sidings, yards, depots, stations and administrative facilities. The total cost of the project is estimated to be \$3.5 bn, and will be financed by the public investment fund (PIF) managed by the Ministry of Finance. The project commenced in 2005 and freight operations began at the end of 2010, while first passenger operations started some two years later.

A commercial corporation, Saudi Railway Company (SAR), was created to maintain and operate the North-South Railway line through a contract-based operator. European-style signaling, ticketing, communications and security systems was installed and commissioned by the French group, Thales and by the Saudi Binladin group for \$453 m.

North-South Railway infrastructure

The North-South Railway will have 107 bridges and 2,679 culverts along the 2,400km freight and passenger line. The entire 2,400km rail route will be equipped with a centralized traffic control (CTC) signaling system. In addition, the industrial rail line will be equipped with a computer-assisted manual block system.

UPS in passenger stations

A modern railway network is critically dependent on a stable and reliable supply of good-quality power. Without it, trains simply do not run. The customer chose ABB's UPSs for the NSR and these were installed in two separate projects.

The first project provided UPS support for all IT, ticketing, telecom and surveillance systems in five passenger stations – Hail, ALJof, Majmaa, Qassim and Qurayat. Each station has nine UPSs altogether: six PowerScale and three PowerWave 33 (2X 60 KVA parallel system) devices, each capable of 15 minutes full autonomy at full load. The PowerScale devices in this first project were rated at 15, 30 and 40 kVA – with two of each being supplied. All the UPSs in this first project will all be online by mid-2014.

New passenger station in Riyadh

The second Project was dedicated to equipping the new passenger station in Riyadh - again to support all IT, ticketing, telecom and surveillance systems. The new station has a total of 12 UPSs. Six of the PowerScale devices have identical specifications to those in the other passenger stations, but in Riyadh there is an additional PowerScale – a two-unit 40 kVA system configured in parallel that provides 30 minutes of full autonomy.

The PowerWave 33 UPS backup is much beefier for this critical, central station: there are no less than four two-unit 60 kVA systems configured in parallel, plus a two-unit 40 KVA parallel system – each of which provides 30 minutes of full autonomy. Delivery of Riyadh equipment started at the beginning of 2014 and implementation will take place in Q3.

Besides protecting the regional passenger stations and the main station in Riyadh, ABB UPSs have also been chosen to protect the traffic control center.

Amir Sanadi, Operation Manager in Site Technology, ABB's business partner who acquired the project and is implementing it, said, "it is quite an accomplishment for ABB UPS technology to be chosen for a project of this scale. Our client was very particular and chose ABB because of its reputation and experience in this field and its advanced, and proven, UPS technology that will guarantee maximum availability of power to this flagship infrastructure project."