Peru's peak performer
High hopes for Peru’s Andean railway

Private concessionaire FCCA, which has been operating and maintaining the world’s second-highest railway in Peru since 1999, has invested heavily in both the infrastructure and its fleet. As Keith Fender reports, from Peru, this is now paying off as freight traffic has more than doubled and the railway is making an operating profit.

The 480km standard-gauge FCCA railway connects the Pacific Ocean port of Callao near Lima with the mining centre of La Oroya and Huancayo located in the high-altitude Mantaro valley with branches to Jauja and Cerro de Pasco high in the Andes. The initial 173km section climbs from sea level to an altitude of 4770m and is entirely adhesion worked despite ruling gradients of 4.5%.

Operation of trains requires real skill as the altitude, combined with the steep gradients, imposes considerable strain on both locomotives and their crews. To gain height six zig-zags, some several kilometres long, are provided where complete trains reverse. As a result, trains are normally restricted to 17 wagons.

For most of its life the railway has been operated by private concessionaires, apart from a period of state ownership between 1972 and 1999, when Peruvian National Railways (Enuter) ran the railway.

FCCA comprises two companies: Central Andina Railways (FVCA), the official concessionaire, which acts as infrastructure manager and manages relations with government, while Central Andino Railway (FCA) is the operator. Both concessionaire and operating company share senior personnel, and major Peruvian shareholder Dr Juan Olavecza is chairman of the two companies. FCCA has a number of other shareholders, notably Railroad Development Corporation, United States, plus several partner or customer companies from the Peruvian mining and cement sectors. However, several financial investors involved at the start of the concession have exited at substantial profit during the last decade.

The railway’s staple traffic is a mixture of minerals, especially zinc, copper and lead, from mines high in the Andes, cement and a high volume of sulphuric acid in the Lima area. Whilst the mineral traffic is transported largely to Callao port, construction materials and diesel fuel are also conveyed from the Lima area to the mines. When the concession started, the railway was only carrying 400,000 tonnes a year. FCCA has benefited from rising global demand for technology and other products, much of which uses the copper, zinc and other metals found in the Andes, which led to an expansion of mining close to the FCCA route. As a result, traffic has grown to 2.5 million tonnes in 2014 while revenue has increased to around SUS 50m a year.

Traffic is expected to reach 4 million tonnes annually by 2018, and the imminent reopening of one of the country’s main copper processing plants in La Oroya, which closed in 2009 due to financial and environmental problems, should add up to 1 million tonnes a year.

Under the concession contract, FCCA is supposed to provide capacity for open-access operators. So far the extreme operating conditions have proved a deterrent, as Mr Jaime Blanco, FCCA’s general manager, explains: “One new entrant did look at operating but decided not to do so after understanding what is involved.” Nevertheless there is open-access passenger operation in Peru on the 914mm-gauge line serving Machu Picchu.

Safety prior to the FCCA takeover was poor, and derailments and other accidents were common. Such incidents have now become very rare as standards both for the track and train operation have improved enormously, backed up by better staff awareness of safety. Operating staff now have personal protective equipment such as steel-tipped boots which previous operators had regarded as unnecessary. Around 800 people work for FCCA, substantially less than the 1900 previously employed by Enuter.

The concession agreement signed in 1999 was for 30 years, with the option to extend it at intervals. So far the concession has been extended twice, and now runs until 2040.

Upgrading the infrastructure to US Federal Railroad Administration (FRA) Level II standards was a requirement of the original concession. Blanco says that the improving performance of the concession led to an agreement with the government to re-invest payments from the concession in further upgrades to the infrastructure to meet FRA Level III standards. “In some parts, the railway now exceeds this,” Blanco says.

As a result of concession amendments in 2009 and 2014, FCCA agreed to improve the condition of the core 222km Callao - Oroya section to FRA Level III which concerns track condition and maintenance standards. Namely Level III allows for 64km/h freight and 96km/h passenger operation although the tortuous nature of the FCCA line means train speeds rarely exceed 50km/h.

The track has been substantially improved with 1135m (35kg) rail replacing older 70 or 80lb (52 or 36kg) rail. Whilst the rail is purchased in 24m
lengths it is normally welded to lengths of 48m or longer to reduce the number of rail joints and consequent wear. The track upgrades coupled with bridge strengthening have increased axleloads from 20 to 32 tonnes.

The Pacific coast of the Americas is prone to extreme weather, especially due to the El Niño phenomenon, often resulting in significant damage to railways. The impending El Niño in 2015-16 is widely forecast to be one of the most damaging for years and FCCA has built large flood defences and reinforced embankments this year with the aim of minimising potential damage in locations known to be prone to flash floods.

Blanco believes that the current growth in business and further expansion of Peru’s mining industry substantial investment in the route could be possible “within a decade.” Top of the list are spiral tunnels to replace the zig-zags and enable operation of longer trains.

In 2006 PVCA presented plans for a 22.5km base tunnel under the Andes from Rio Blanco to Arape which would have replaced the existing summit tunnel and three of the six zig-zags. The PFP project would have entailed changes to the concession agreement. While nothing happened, as the government did not regard the railway as a national priority, there is a glimmer of hope. Chinese Premier Mr Li Keqiang visited Peru in May to discuss proposals for a new trans-continental railway linking Santos near São Paulo in Brazil with the northern Peruvian port of Callao. FCCA has previously expressed interest in participating in this project along with construction firms, GE, Brazilian operator ALL, and Korean operator Korail, but how this proposal fits with the plans by the Chinese to fund or build the new line is unclear.

FCCA inherited a mixed fleet of older Alco and EMD locomotives from Endera. FCCA has taken advantage of a clause in the concession agreement which returns surplus assets to the Peruvian government by disposing of its older locomotives. Most of the 26-strong locomotive fleet are GE models rebuilt for operation in Peru after service in the United States or elsewhere. FCCA is currently completing the conversion of 15 GE C39-8 locomotives bought secondhand from Norfolk Southern for use on its network. The diesel engines were removed for overhaul in the United States prior to shipment. The work, which is being done at FCCA’s Chosica depot, located around 50km east of Lima, includes reducing the size of the locomotives’ bodies to enable them to fit through the small Andean tunnels and installing a second air-brake system.

More than 700 wagons are in service on the FCCA network, some of which are now owned by customers. Trinity Rail was chosen to supply 230 bogie ore concentrate wagons and has also supplied 90 sulphuric-acid tank wagons.

FCCA resumed limited passenger services from Lima to Huancayo in 2002. Operation is a challenge as the trains need to carry oxygen and a doctor onboard, as well as police for security. The trains run six to eight times a year and as they normally sell out, the company plans to increase the frequency to twelve trains a year from 2016.

FCCA undertook the conversion of the 914mm-gauge line from Huancayo to Huancavelica to standard gauge. The $23m scheme was funded by the Peruvian government and the Development Bank of Latin America. Although the re-gauging work was completed in late 2010, passenger services operated on behalf of the Huancavelica regional government did not resume until September.

Now the line is connected to the existing FCCA network, there is potential to carry mineral traffic from mines near the route. While the government is re-tendering the concession for the route, Blanco says FCCA is unlikely to participate as he is unhappy with the proposed tender conditions.

In recent years FCCA has presented a number of proposals to the government for rail investment away from the concession’s main route and it is still interested in future opportunities. For example, Blanco says FCCA may look at participating in the new metro Line 3 project in Lima “depending on the contract conditions.”

The outlook for rail in Peru is a lot brighter now than it was just a few years ago. Blanco says that discussion of new trans-continental lines and the development of the metro network in Lima mean that “interest in rail has been awakened in the wider population and investors are starting to become seriously interested in possibilities.”

A freight train passes through Chosica where FCCA has its main workshops.

Trains meet at a passing loop on the mountainous section of the railway.