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Year: 2013 / Issue: 5

Elgi breathes air into 4G

Technology is constantly changing. After close to a decade of 3G, the technology was showing signs of cracking under the demands of applications such as streaming media. New technologies that offered nothing less than a 10-fold increase in speed over 3G were required. WiMAX and LTE have been named '4G (fourth generation)'. IP telephony, cloud computing, gaming services, video conferencing and high-definition mobile TV are among the conceivable applications of 4G.

In India, Reliance Industries Ltd (RIL) is rolling out high speed wireless broadband services, termed 4G services, initially in Mumbai, Delhi and Jamnagar. RIL will be touting speeds of up to 50–100 Mbps on its network. RIL's tower unit Reliance Infratel has more than 50,000 towers, a huge number of which is connected through a fibre-optic backbone, high-speed data transfer possible. Optical fibres are very solid structures providing the frameworks on which the networks run.

On land, optic fibre cables are commonly laid underground. They are passed through ducts from one junction box to another in lengths of 2 to 5 kilometres. The ducts are made of polyethylene. Multiple ducts are laid in parallel so that additional cables can be installed in the future.

Traditionally, optic fibre cables were pulled through the ducts using winch lines. Cables are now commonly installed in the ducts by jetting, an alternative to pulling. In this process, the cable is pushed into a duct. At the same time, compressed air is injected into the duct. The air flows at high speed, dragging the cable along.

The equipment required for cable jetting consists of a compressor and a feeder box. The cable is delivered to the feeder box by a pair of hydraulic rollers. The feeder box gathers the cable and the compressed air and directs them into the ducts. The pushing force provided by the rollers and feeder box increases the jetting distance considerably. Unlike cable pulling, equipment is needed only at one end of the duct.

Optical cables are also sensitive to the physical properties of the compressed air. If the air temperature is more than 10 degrees Celsius above the ambient temperature, the optical properties of the fibres may not be preserved. In practice, because cables are usually laid in remote locations, portable diesel-powered compressors are required to supply the compressed air. Diesel powered compressors typically deliver air at temperatures 40 to 50 degrees Celsius above ambient. So coolers must be used to bring down the temperature of the air before it enters the feeder box.

Further, moisture must not be allowed to condense from the compressed air on the cable. Moisture on the cable will lead to clumping and large pressure drops, and the cable will not travel to the next junction box. The jetting process will then need to be interrupted to clean the cable and duct, thus increasing the time required for installation. Hence, a moisture separator is employed to dry the compressed air entering the feeder box. Once the end of the cable reaches the next junction box, all the equipment moves there.

Elgi has supplied DT 400-175 model diesel powered compressors to Infotel for laying Optical Cable Fibres. The compressors, with an operating pressure of 175 psig, are supplied with after-coolers and moisture separators to kick-start the 4G revolution in India.