India Needs Smart Cabling Solutions

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INDIA'S RAPID RATE OF industrialisation has fuelled the growth of towns and cities, resulting in more people moving to cities in search of employment. This, in turn, has led to the need for smarter and safe cities to cater to the increasing urban population. According to McKinsey's latest report – India's Urban Awakening: Building inclusive cities, sustaining economic growth - population trends show that by 2030 about 590 million people will be living in cities in India, double the population of USA today. It also estimated that about 270 million people will come under the working age population over the next 20 years. And about 70% of new employment is estimated to be generated from cities. To change the urban landscape of the country, India will be spending close to $1 trillion on infrastructure by 2017 which includes development of Smart Cities over the next five years.

Need for Smart Cities

To accommodate this massive urbanisation, India needs to find smarter ways to manage complexities, reduce expenses, increase efficiency and improve the quality of life in terms of assured water and electricity supply, sanitation and solid waste management, efficient urban mobility and public transport, robust IT connectivity and e-governance. Smart Cities would also ensure smart meters to monitor energy usage, monitoring water quality, renewable source of energy, efficient energy and green building, smart parking, and intelligent traffic management system.

The Union Budget of 2016-17 has earmarked an amount of ₹32.05 billion for the development of 100 smart cities across the country by 2020. The focus of the Smart Cities mission includes provision of clean water, setting up of sanitation and solid waste management systems, efficient mobility and public transportation and affordable housing. Given that the urbanisation level in India is still at around 31%, far lower than China's 54%, Brazil's 90% and well over 80% in most developed economies, the government's policy thrust on upgrading urban infrastructure

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could see this list of 20 smart cities being expanded to 100 urban centres and the up gradation of basic infrastructure across 500 cities.

Safe Smart Cities

Re-development of cities will entail huge requirement of infrastructure. This would in turn mean that thousands of acres of land would be converted to industrial and IT parks, commercial office spaces, retail and entertainment zones, and above all, housing schemes creating ample opportunities of investment for the infrastructure and real estate development sector. The re-development would be aligned to keep up with the growth of the Indian economy. These sophisticated urban business centres would cater to the workforce demands offering comfort and seamless connectivity.

This growing infrastructure development means that one is entirely dependent on wire and cables to ensure seamless connectivity and 100% availability. Although approximately 80% cables around us are not visible once installed, cables are critical for ensuring power availability, automation and seamless connectivity through data transmission.

Cables account for approximately 90% of all plastic materials in electrical engineering systems. However, the quality of material is of major concern. Fire mishaps caused by short circuits are mostly attributed to the usage of poor quality insulation material which is not flame retardant. In the 50s, the average time from ignition of a fire to flashover was 15 minutes. Now fatal accidents can occur just after three minutes. This change has come about because of the increased use of plastics in manufacturing of wires and cables. Most of the buildings use wires which are PVC cables containing chlorine. These cables produce combustion gases and smoke that are harmful to people and equipment. Breathing in hot combustion gases acutely and permanently harms the alveolar in the lungs. Toxic smoke and gas numbs the brain's activity, causes irritation, impairs vision and prevents a person from locating a safe exit, thus, creating panic

during emergencies.

In order to minimise loss during a fire incident, intelligent cabling solutions in terms of fire safety and fire survivability is the need of the hour. Any cables used within public buildings should, as a minimum requirement, present no danger to the health of people or integrity of property through acid gas emissions during a fire.

Today, need for low smoke emissions, low generation of corrosive and toxic gases and low flame propagation characteristics have produced a rapidly growing market for halogen-free flame retardant (HFFR) and fire survival (FS) cables. These cables come with annealed bare copper or annealed tinned copper conductors and their inner sheath comes with halogen free compound with galvanised steel wire which prevents spreading of fire. These cables are designed to maintain circuit integrity for vital safety and rescue equipment during the fire. These cables are specially designed for optimum cabling solutions under fire mishap by maintaining the circuit integrity for temperatures up to 6500C, 7500C and/or 9500C as per application requirements. The inner and outer sheaths are specially designed with halogen free compound which reduces emission of fumes and acid gases in the event of fire.

For fixed installations today, cables run internally through pipes and under the plastering as well as in closed installation channels. For special application requirements such as crane and lift application, PVC and rubber flat cables are used. These cables also come with supporting elements which are cold resistant. For keeping those bytes running at high speed in offices, screen flamed retardant cables are used which can transmit up to 10 MB per second. Keeping the safety aspect in mind, low frequency data cables are used for alarm and telephone systems.

In addition to fire survival cables, cables that take care of a building's heating, ventilation and air-conditioning, lighting and other systems through a Building Management System (BMS) or Building Automation System (BAS) are also of importance.

Building automation improves occupant comfort, facilitates efficient operation of building systems, and reduces energy consumption and operating costs, and smart cables are needed for monitoring and programme devices. In building applications, coaxial cable allows distortion-free and low-attenuation transmission of signals with a high bandwidth and high frequencies. CAT 6 data transmission cables used for data transfer are the horizontal network backbone for wiring office, administration and development buildings.

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Unlike in the past where cities were dependent on the availability of land, the fate of cities in the future will depend on availability of optical fibre networks and next-generation infrastructure. And cables become of critical importance in the development of these smart cities. Cables can ensure uninterrupted connectivity in terms of power supply and data transmission, but they also play a vital role in process automation such as intelligent energy management systems and traffic signals; thus ensuring the dream of fully automated and connected smart cities.

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Views expressed are personal.