

Optimum utilization of Transmission Assets for Telecom Purpose

The Digital India Program of Govt. of India envisages universal mobile connectivity. India has deficiency of Telecom mobile network coverage in rural/remote areas and countless sparsely populated areas with poor connectivity. Major constraint for improving the mobile connectivity are:

-) Mobile operators need to incur high capital cost towards Land and Towers
-) Non-availability of reliable power supply source making it dependent on DG power resulting into high operational cost

The Government of India has also been emphasizing on the need for low cost shared infrastructure for rural mobile coverage. Further, TRAI has emphasized for reduction in carbon footprint through reducing use of DG set at mobile tower locations and utilizing alternate possible energy source including renewable.

POWERGRID has about 2.5 Lakh EHV transmission towers located across the country and most of them are in remote and sparsely populated area. The above constraints can be overcome to a large extent if these transmission towers are used for mounting the telecom antennas and also for mounting the Base Transceiver System (BTS) and associated auxiliary power supply equipment for mobile communication by constructing a platform on the transmission line tower itself. Further, reliable power supply can also be provided for operation of BTS equipment from transmission line itself by adopting suitable technologies.

In last few years, POWERGRID has explored the telecom market to use these towers for mobile telecom communication also. However, it emerged that Transmission Line Towers can be utilized more effectively for Telecom Mobile communication purpose, if reliable power and space can also be provided locally.

POWERGRID has established a demo set-up as an R&D project to demonstrate the functioning of the system including Mobile Base Transceiver System (BTS) on a 400kV (D/C) line by isolating approximately 6 km of earth wire using insulators and arching horns across insulators to take care of intended lightning protection. Induced charging current of isolated earthwire is tapped at one point using Power PT (specifically developed for this purpose) and LA arrangement. Power of about 6kW can be drawn by this arrangement. Additional power can be drawn by increasing the length of isolated section of earth wire or by using earth wire of 765kV line and using PT of suitable capacity. The advantage of this successful experiment is that Power loss which otherwise is happening continuously through earth wire is utilized by tapping of power through isolated Earth Wire, for mobile Telecom operation, without any additional generation and transmission losses. Platforms have also been designed for mounting power equipment and BTS and associated panels, batteries, chargers etc. on the existing tower.

The Proposed arrangement shall have the following advantages:

-) Since all Power tapping equipment are connected to Earth Wire, any outage of connected equipment will not cause tripping of EHV line and also there is no other impact on transmission line operation/availability.
-) There is no requirement of land as all equipment can be kept on the transmission line tower itself.

-) Since Transmission line availability is generally more than 99.5%, the said arrangement shall provide highly reliable power, thereby eliminating need of DG set, consumption of diesel and reducing carbon footprint.
-) Improving mobile connectivity and quality of service in areas having deficiency of Telecom mobile network coverage thus help the Digital India program of Govt. of India.

POWERGRID is therefore contemplating to utilize its existing transmission assets for the purpose of mounting telecom antennas for Mobile Telecom Service Provider (TSP)/Telecom Operators and to provide electricity for operation of mobile communication equipment by tapping the induced power in the earth wire without affecting the electricity transmission activities of POWERGRID.