

Application of INSAT STFS Broadcast to Electric Power Industry

A. K. Hanjura and A. Sen Gupta
National Physical Laboratory, Dr. K. S. Krishnan Road, New Delhi, India
hanjura@mail.nplindia.ernet.in

ABSTRACT

National Physical Laboratory (NPLI), New Delhi, is disseminating Standard Time and Frequency Signal (STFS) as a serial time code via Indian domestic satellite INSAT [1]. Currently, the time service is via INSAT-3C. This one-way time transfer provides very precise time epoch to the user. Typical inaccuracy in the received time epoch is $\sim 10 - 20 \mu\text{s}$. This national service has been in operation since March 1988. The STFS dissemination service of NPLI is being used widely in India by many agencies like research laboratories, National Television Broadcast and All India Radio. However, the single largest user is the electric power sector, that uses the precise time information for its grid management. STFS systems are used by the Eastern grid and almost the entire Western power grid. Some stations of the Northern grid are also using this service and the number is increasing every year.

In this paper, we shall describe a typical STFS receiving system and its interface with the power station equipment. Distribution of noise-free time signals in the high EMI environment, that is present in the power stations, and over distances exceeding few kilometers, requires conversion of signals into potential free contacts and later converting them to electrical signals at the other end using appropriate interface.

REFERENCES

- [1] Sen Gupta A., Ashok K. Hanjura and B. S. Mathur, "Satellite broadcasting of time and frequency signals," Proc IEEE, Vol 79, pp 973-982, July 1991.