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Preferential Subject N° 3

Precision timing distribution over terrestrial way

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The emerging of distributed generation in power systems generates greater vulnerability facing to events that may cause loss of stability. One way to keep this stability under control is based on expert systems that know the information of system status at any moment and can take action on the network. The information system can instantly get the network status by mean of synchrophasors, which have greater demands on the accuracy of the time stamp than those required by the SCADA system. That precision timing can be achieved by GPS or GNSS systems. But what is the alternative when the satellite signal is lost? NTP synchronization over packet network protocols, which can be very useful for SCADA systems, do not have enough accuracy, and the autonomy of local clocks is very limited. Therefore a second source of synchronization is required. This backup path must be terrestrial and based on a precision protocol like the IEEE 1588v2. This protocol allows timing accuracy <1 microsecond, which is suitable for synchrophasors, but has some demands on the hardware that support it. In UTE (www.ute.com.uy) a pilot implementation of this protocol was performed on a network segment comprising 10 high voltage stations, overlooking extend this way of terrestrial precise synchronism across the high voltage network.