

How did determine circuit sections, when applied the DLR system to the whole circuit?

The circuit sections are the circuit mechanical sections, i.e., the length of the circuit between two consecutive dead-ends.

According to the ruling span theory, within a section, defined as in the previous paragraph, all the spans have the same horizontal tension and the same equivalent temperature. Therefore, for monitoring the whole circuit, from a DLR perspective, it is not necessary to monitor all the spans, but all the sections.

From the tilt the sensor computes the sag of the span where it is installed in, and then the real time thermal rating algorithm determines the equivalent temperature of the conductor, which is valid not only for the span but for the whole section. Afterwards, the effective wind for the section is calculated.

This process is applied to all the sections, and in each moment the transmission capacity is the lowest one among all the sections.

It is worth to mention that the Spanish TSO does not use the concept of critical span and the DLR system monitors each and every section of the line.

How can be considered the application of low-cost temperature measurement DLR sensors?

As mentioned in the paper, it would be very beneficial to use low-cost temperature sensors for DLR applications. The thing is that these sensors must be able to yield the equivalent conductor temperature for the section (defined as in the previous question).

According to previous experiences, at least in transmission lines, spot measurements are not representative of the conductor equivalent temperature, since the temperature varies a lot even within the same span.

The OPPC would be a good solution but is not low-cost when applied to existing lines.