Spotter's Guide - Transposition Towers

Issue 5

There is one very special design of pylon called a Transposition Tower, which we do not require in the UK - but that does not mean there's nothing to spot! Its purpose is very specific - to swap the electricity from one wire onto another.

Why is this needed? Well, each pylon carries wires in multiples of three. In each set of three, one wire will be for each phase. Each wire needs to have the same capacitance as each other. However, the different heights at which each line is carried means there can be a small difference between them.

This is not a problem in the UK because our powerlines don't run very far, but in areas such as across Africa or Continental Europe where the lines run for hundreds of miles, the differences between the sets of wires can be enough to cause problems. So a transposition tower is used to swap the electricity from one line onto another, so that over the entire route, the capacitance of each line will be more-or-less the same.

You might think this means there is nothing to see, but that's not the case! Early power lines in the UK *did* use transposition towers, but when they proved to be unnecessary, the transpositions were removed when the powerlines were replaced. The old transposition towers are just used as ordinary pylons, but the extended top and bottom crossarms are clearly visible. That's what's happened to the pylon shown on the left - a PL1b series tower.

What I've said applies for double-circuit transpositions (where there are a pair of wires at each height, one on each side). Single-circuits (where there are just three wires on each pylon) work differently.

Imagine a long line of pylons with one arm out on one side and two arms out on the other. The way to make the transposition is to put one pylon the other way round to all the others. That way you can achieve the transposition in two spans. It looks very odd but neatly avoids the need for a special tower. These pylons were left in place, so when you are looking at a line of single-circuit pylons, you might spot one which is positioned the wrong way round.

A transposition has been spotted in Redruth, Cornwall – on a pole! It's shown below, next to a transposition tower in Beilen, Netherlands.

Transposition towers are quite rare – can you spot any?