

IEEE Standards Interpretation for IEEE Std 1410™-1997 IEEE Guide for Improving the Lightning Performance of Electric Power Overhead Distribution Lines

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Interpretation Request #1

a.) Provide equations and models showing relation of shielding factor, distance of object from distribution lines, object height and distribution line height that are shown in Figure 4 on page 8 of IEEE Std 1410-1997 (shielding from nearby structures and trees).

b.) Provide equations of equivalent number of induced flashovers for different spans to the next arrester that are shown by Table B.2 on page 34 of IEEE Std 1410-1997.

Interpretation Response #1

In general, there are several different models that can be used to derive the shielding factor. One is given in Equation 4, with an attractive radius of 14 times the pole height, raised to the 0.6 power, for the receptor zone to either side of the structure. For the 10-m line this attractive radius would be 56 m and for the 20-m line of objects the attractive radius is 84 m.

Another IEEE model uses a fixed exposed width based on the stroke current, using for example the model of (Striking Distance) = 10 times (stroke current in kA) raised to the 0.65 power. For a median 31-kA strike, this would give a fixed striking distance of 93 m.

The section on induced flashovers will be revised in the new version of IEEE 1410 to introduce new findings and conclusions from recent work around the world.