

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

Copyright © 2005 by the Institute of Electrical and Electronics Engineers, Inc. 3 Park Avenue New York, New York 10016-5997 USA All Rights Reserved.

This is an interpretation of IEEE Std 1410-1997.

Interpretations are issued to explain and clarify the intent of a standard and **do not** constitute an alteration to the original standard. In addition, interpretations are not intended to supply consulting information. Permission is hereby granted to download and print one copy of this document. Individuals seeking permission to reproduce and/or distribute this document in its entirety or portions of this document must contact the IEEE Standards Department for the appropriate license. Use of the information contained in this document is at your own risk.

IEEE Standards Department Copyrights and Permissions 445 Hoes Lane, Piscataway, New Jersey 08855-1331, USA

January 2005

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.