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IEEE Guide on the Prediction, Measurement, and Analysis of AM Broadcast Reradiation by Power Lines

IEEE Power and Energy Society

Sponsored by the
Transmission and Distribution Committee

IEEE
3 Park Avenue
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USA

IEEE Std 1260™-2018
(Revision of
IEEE Std 1260-1996)

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Abstract: A set of procedures to be followed to cope with reradiation of AM broadcast signals from power lines and other large metallic structures is provided. Reradiation may be described as electromagnetic waves radiated from a structure that has parasitically picked up a signal from the environment. A simplified prediction technique called a *survey* is described to determine which structures could possibly cause a problem. Guidelines for measurements and data analysis are included.

Keywords: AM broadcast, IEEE 1260™, interference prediction, measurement, power lines, reradiation

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Introduction

This introduction is not part of IEEE Std 1260-2018, IEEE Guide on the Prediction, Measurement, and Analysis of AM Broadcast Reradiation by Power Lines.

This guide provides a set of procedures to be followed to cope with reradiation of AM broadcast signals from power lines and other large metallic structures. Reradiation may be described as electromagnetic waves radiated from a structure that has parasitically picked up a signal from the environment. A simplified prediction technique called a *survey* is described to determine which structures could possibly cause a problem. Guidelines for measurements and data analysis are included.

While the procedures listed in this guide may be applicable to reradiation problems from other medium frequency (MF) sources, such as navigation beacons, they are not intended to be applied to reradiation problems from higher frequency sources, such as television broadcast signals. It is anticipated that this guide will be used by owners of potentially reradiating structures and radio stations. It is not designed to be applied as legal evidence of harmful effects of a reradiating structure upon an AM broadcasting station.

In some political jurisdictions, the government regulatory or licensing authority has defined specific procedures for the determination of radiation patterns of medium wave antenna systems. Some of these procedures are also contained in international treaties and agreements, and as such are binding on the licensees of the signatory jurisdictions. When there is agreement between the party or parties who are licensed to operate the medium wave antenna system(s) in question and the parties proposing construction of potential reradiating structures, the procedures of the responsible government agency or authority shall have precedence over the method outlined in this guide.

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1. Overview

1.1 Scope

This guide provides a set of procedures that can be used to cope with reradiation of AM broadcast signals from power lines. It can also be applied to other large metallic structures.

While the procedures listed in this guide may be applicable to reradiation problems from other medium frequency (MF) sources, such as navigation beacons, they are not intended to be applied to reradiation problems from higher frequency sources, such as television broadcast signals. This guide is not designed to be applied as legal evidence of harmful effects of a reradiating structure upon an AM broadcasting station.

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1.2 Purpose

An AM broadcast array is carefully constructed to radiate strongly towards listeners and weakly in directions where interference to other stations could result. Reradiation can occur when the broadcasted signals are parasitically picked up by a large metallic structure and then rebroadcasted, or reradiated, from that structure. Many structures may reradiate an AM and other radio signals, e.g., power lines, communications towers, water towers, and buildings.

This can result in a decrease in signal towards listening areas and an increase in signal in protected directions. The process of predicting, measuring, analyzing, and mitigating the interference is complex and nontrivial, and is why this guide was developed. It is anticipated that this guide will be used by owners of potentially reradiating structures and radio stations.