

IEEE Standard for Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers

Sponsor

**Power System Relaying Committee
of the
IEEE Power Engineering Society**

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Abstract: A design test to evaluate the susceptibility of protective relays to single-frequency electromagnetic fields in the radio frequency domain, such as those generated by portable or mobile radio transceivers is established.

Keywords: electromagnetic compatibility, protective relays, radiated electromagnetic interference, relays, relay systems, transceivers

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Introduction

(This introduction is not a part of IEEE Std C37.90.2-1995, IEEE Standard for Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers.)

The use of hand-held transceivers (walkie-talkies) has increased dramatically over the past few years. When operated in close proximity to a static protective relay, these transceivers will produce local, high field-strength electromagnetic radiation that may affect relay performance. The need for a standard on radiated interference withstand capability for static protective relays is, therefore, apparent.

In 1985, the Working Group on High-Frequency Radiation Effects on Static Control and Protection Devices of the Power System Relaying Committee produced a trial-use test standard to meet this need. The standard was published in 1987 as IEEE Std C37.90.2-1987. During the trial-use period, members of the Working Group and other users of the test provided comments and suggestions for its revision. These comments are incorporated into this new standard.

The principal changes made as a result of the trial-use experience are as follows:

- a) The test field-strength level has been increased from 10–20 V/m to 35 V/m. The 35 V/m level is intended to roughly approximate the effect of a walkie-talkie operated at 15 cm (6 in) from the exposed surface of the relay and is the result of extensive testing by members of the Working Group.
- b) The method of measuring and maintaining the specified test level has been left to the user rather than specified in the standard. Also, the use of discrete frequency steps has been made an alternative to a continuous sweep of the frequency. These changes are in recognition of the variety of modern equipment used to conduct these types of tests.
- c) The requirement for shielded external wiring to the relay under test has been replaced with a requirement for non-shielded external wiring, unless the manufacturer specifies shielded wiring for the normal installation of the device.
- d) The in-service conditions of the SWC test in IEEE Std C37.90.1-1989, have been adopted for the EMI test.
- e) The Digital Equipment Modulation Test has been deleted, since it did not appear to yield any additional information. The Keying Test has been revised.
- f) A caution has been added that successfully completing the standard test demonstrates a practical level of EMI withstand capability but does not guarantee that false relay operations cannot be caused by incautious use of walkie-talkies in close proximity to the relays.

We encourage comments in the form of technical papers that permit formal discussion and closure. Direct them to the IEEE Technical Activities Department, Special Services for PES.

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