

P149

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Type of Project: Revision to IEEE Standard 149-1977

PAR Request Date: 15-Oct-2015

PAR Approval Date: 05-Dec-2015

PAR Expiration Date: 31-Dec-2019

Status: PAR for a Revision to an existing IEEE Standard

Root Project: 149-1977

1.1 Project Number: P149

1.2 Type of Document: Recommended Practice

1.3 Life Cycle: Full Use

2.1 Title: Recommended Practice for Antenna Measurements

Changes in title: ~~IEEE Recommended Standard Practice Test Procedures for Antennas~~ **Antenna Measurements**

3.1 Working Group: Test Procedures for Antennas (APS/A/TestProcAnt)

Contact Information for Working Group Chair

Name: Jeffrey Fordham

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Contact Information for Working Group Vice-Chair

None

3.2 Sponsoring Society and Committee: IEEE Antennas and Propagation Society/Antennas (APS/A)

Contact Information for Sponsor Chair

Name: Vikass Monebhurrun

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Contact Information for Standards Representative

None

4.1 Type of Ballot: Individual

4.2 Expected Date of submission of draft to the IEEE-SA for Initial Sponsor Ballot: 12/2016

4.3 Projected Completion Date for Submittal to RevCom: 10/2017

5.1 Approximate number of people expected to be actively involved in the development of this project: 20

5.2 Scope: This document comprises recommended practices for the measurement of antenna transmitting and receiving properties. It is a comprehensive revision and extension of ANSI/IEEE Std 149-1979.

Throughout this standard it may be assumed that the antenna to be measured can be treated as a passive, linear, and reciprocal device. Therefore its radiation properties can be measured in either the transmitting or the receiving mode. Many of the test practices described can, however, be adapted for use in the measurement of antenna systems containing circuit elements that may be active, nonlinear, or nonreciprocal. For these cases there is no simple relationship between the antenna systems transmitting and receiving properties. Therefore measurements shall be performed for the mode or modes in which the antenna system has been designed to be used.

A fundamental property of any antenna is its radiation pattern. The measurement of radiation patterns in an antenna test facility is discussed. The design of antenna test facilities is described along with instrumentation requirements for the proper operation of the antenna facility, directions for the evaluation of an (existing) range, and the

Changes in scope: This document comprises ~~test recommended procedures~~ **practices** for the measurement of antenna **transmitting and receiving** properties. It is a comprehensive revision and extension of ~~the previous test procedure~~ **ANSI/IEEE Std 149-1965 (Reaff 1971) 1979**. Throughout this standard it ~~is~~ **may be** assumed that the antenna to be measured can be treated as a passive, linear, and reciprocal device. Therefore its radiation properties can be measured in either the transmitting or the receiving mode. Many of the test ~~procedures~~ **practices described** can, however, be adapted for use in the measurement of antenna systems containing circuit elements that may be active, nonlinear, or nonreciprocal. For these cases there is no simple relationship between the antenna ~~system~~ **systems** transmitting and receiving properties. Therefore measurements shall be performed for the mode or modes in which the antenna system has been designed to be used. **A fundamental property of any antenna is its radiation pattern. The measurement of radiation patterns in an antenna test facility is discussed. The design of antenna test facilities is described along with instrumentation requirements for the proper operation of the antenna facility, directions for the evaluation of an (existing) range, and the operation of ranges is discussed. For each**

operation of ranges is discussed.

For each direction of space, the radiation pattern is characterized by amplitude, phase, and polarization. From the measurement of these parameters, gain, directivity and radiation efficiency can be determined.

Power transfer from generator to antenna is controlled by the input impedance to the antenna. This important parameter frequently limits the useful bandwidth of the antenna. Measurement procedures and network descriptions are described.

Measurement of the radiation pattern includes errors. A method adopted in other standards is presented and discussed for its applicability to the various test facilities described.

Throughout this standard, attempts are made to discuss measurement techniques as thoroughly as is practicable. However, in general step-by-step procedural descriptions have been avoided. References are provided which are illustrative of measurement techniques and in which details may be found.

5.3 Is the completion of this standard dependent upon the completion of another standard: No

5.4 Purpose: The purpose is to provide guidance on the measurement of antenna transmitting and receiving properties. **Changes in purpose:**

5.5 Need for the Project: The existing standard has not been revised since 1979.

5.6 Stakeholders for the Standard: Stakeholders include engineers, researchers, companies, government, academia and other individuals and organizations involved in the area of antenna design, development, procurement, manufacturing, evaluation and use. The primary stakeholders are those within the aforementioned groups interested more specifically in the evaluation and testing of antennas and in the design of antenna measurement facilities.

Intellectual Property

6.1.a. Is the Sponsor aware of any copyright permissions needed for this project?: No

6.1.b. Is the Sponsor aware of possible registration activity related to this project?: No

7.1 Are there other standards or projects with a similar scope?: No

7.2 Joint Development

Is it the intent to develop this document jointly with another organization?: No

8.1 Additional Explanatory Notes (Item Number and Explanation):

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