



ATIS-0600316.2019(R2024)

**Electrical Protection of
Telecommunications Outside Plant**

AMERICAN NATIONAL STANDARD FOR TELECOMMUNICATIONS



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American National Standard for Telecommunications

Electrical Protection of Telecommunications Outside Plant

Alliance for Telecommunications Industry Solutions

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American National Standards Institute, Inc.

Abstract

Telecommunications outside plant, by nature of its outdoor location, and frequent joint-use or joint right-of-way installations with power utility facilities, is often subject to disturbances from lightning and ac power line faults. This standard provides the minimum electrical protection, grounding, and bonding criteria necessary to mitigate the disruptive and damaging effects of lightning and ac power faults. It is intended to serve as a guide for designers of such facilities in the application of electrical protection, grounding, and bonding, as a function of the electrical environment.

Foreword

The information contained in this Foreword is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI's requirements for an ANS. As such, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the standard.

The Alliance for Telecommunication Industry Solutions (ATIS) serves the public through improved understanding between providers, customers, and manufacturers. The Sustainability in Telecom: Energy and Protection (STEP) Committee – formerly the Network Interface, Power, and Protection Committee (NIPP) – engages industry expertise to develop standards and technical reports for telecommunications equipment and environments in the areas of energy efficiency, environmental impacts, power and protection. The work products of STEP enable vendors, operators and their customers to deploy and operate reliable, environmentally sustainable, energy efficient communications technologies. STEP is committed to proactive engagement with national, regional and international standards development organizations and forums that share its scope of work.

The project to establish minimum requirements for the electrical protection of telecommunications outside plant was initiated as a Project Team under Committee STEP Telecommunications and NEP Subcommittee.

Disturbances from lightning and ac power line faults may be disruptive to telecommunications service and may also result in damage to the telecommunications plant and equipment. Telecommunications outside plant is often exposed to such disturbances because of its physical location and frequent joint-use or joint right-of-way installations with power utility outside plant facilities. Telecommunications service providers employ electrical protection measures that are intended to reduce the effects of such disturbances. ANSI C2, *National Electrical Safety Code*[®] (NESC[®]), covers the safety aspects of the installation, grounding, and bonding of telecommunications outside plant. This standard provides the minimum electrical protection requirements intended to mitigate the disruptive and damaging effects of lightning and ac power faults to telecommunications outside plant. It is not intended that this standard supersede NESC[®], but that it provide additional information intended to ensure the reliable functioning of the telecommunications outside plant.

Subject matter experts were gathered under the auspices of Committee STEP to determine the minimum satisfactory criteria for the electrical protection of telecommunications outside plant.

Suggestions for improvement of this standard will be welcome. These should be sent to the Alliance for Telecommunications Industry Solutions, STEP, 1200 G Street, NW, Suite 500, Washington DC 20005.

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American National Standard for Telecommunications –

Electrical Protection of Telecommunications Outside Plant

1 Scope

1.1 Telecommunications Outside Plant Covered in this Standard

This standard applies to the electrical protection, bonding, and grounding of telecommunications outside plant facilities. These facilities may consist of paired-conductor cable, wire, coaxial cable, and optical fiber cable, either singularly or in any combination, and associated equipment such as closures, pedestals, electronic apparatus cases, and cable terminals. The outside plant may be aerial, direct buried, or underground. The outside plant is the transmission media interconnecting telecommunications central offices and similar facilities as described in ATIS-0600313 [1], *Electrical Protection for Telecommunications Central Offices and Similar Type Facilities*, to other such facilities or to the telecommunications customer premises at the telephone protector or equivalent location. The electrical protection, bonding, and grounding measures presented in this standard are intended to assist in protecting communications facilities from the effects of lightning, electric power systems, and Electromagnetic Interference (EMI).

1.2 Items Not Covered in this Standard

Specific EMI mitigation designs and the electrical protection of central offices and similar facilities, microwave and radio tower structures, the customer network interface, and non-insulated open wire are not covered in this standard. Device-level specifications for electrical protection apparatus are not included in this standard. Optical fiber cables not under the exclusive control of a communications carrier, or not meeting the requirements of NESC® (see clause 2), for a communication line are not covered. Dedicated outside plant serving commercial or privately-owned electric power generating stations and substations is not covered. For additional information on electrical supply locations, see IEEE 487 [6], *IEEE Standard for the Electrical Protection of Communications Facilities Serving Electric Supply Locations – General Considerations*. This standard is not intended to be a safety standard for personnel protection.

1.3 Application of Electrical Protection

The same degree of electrical protection may not be required on all outside plant. This standard defines, based upon the electrical environment, the criteria necessary to determine the electrical protection that should be applied. The primary consideration is the exposure of the outside plant to sources of unwanted voltage such as lightning and electric power. Other factors, such as those relating to telecommunications service reliability, may dictate the need for electrical protection measures exceeding those described in this standard.

2 Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

The following documents or portions thereof are referenced within this standard and shall be considered part of the requirements of this document.