ATIS-0600313.2019

Electrical Protection for Telecommunications Central Offices and Similar Type Facilities

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American National Standard for Telecommunications

Electrical Protection for Telecommunications Central Offices and Similar Type Facilities

Alliance for Telecommunications Industry Solutions

Approved September 25, 2018

American National Standards Institute, Inc.

Abstract:

Telecommunications central offices, data centers, electronic equipment enclosures (EEE), and similar type facilities are often subjected to disturbances from lightning and AC power line faults, either directly or indirectly, through the communications cables and AC power facilities that serve them. 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*®, 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 ANSI C2, 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.

At the time of consensus on this document, STEP which was responsible for its development, had the following leadership:

E. Gallo, STEP Chair (Ericsson)
J. Fuller, STEP Vice Chair (AT&T)
D. Ashton, STEP-NEP Chair (Ericsson)
J. Fuller, STEP-NEP Vice Chair (AT&T)
D. Ashton, STEP-NEP Technical Editor (CenturyLink)

The Network Electrical Protection (NEP) Subcommittee was responsible for the development of this document.

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1 Scope

This standard applies to the electrical protection at telecommunications and electrical power conductor entrances to telecommunications central offices and similar type facilities, and to bonding and grounding (earthing) within these facilities. Such electrical protection, bonding, and grounding (earthing) is intended to assist in protecting personnel and telecommunications plant from the effects of lightning surges power contacts, power induction, and ground potential rise. For requirements applying to towers mounted on buildings, see ATIS 0600334 [12], *Electrical Protection of Communications Towers and Associated Structures*.

1.1 Telecommunications Facilities Covered

Telecommunications facilities included are central offices, data centers, HUTS, Controlled Environmental Vaults (CEVs), and electronic equipment enclosures (EEE). These locations would be under the control of the telecommunications service provider. See the informative Annex B for a graphic explanation of facilities covered by this standard and other related NIPP standards.

1.2 Application of Electrical Protection

Not every facility covered by the scope of this document will require the same level of electrical protection. This standard establishes, based upon the electrical environment, the criteria necessary to determine the level of electrical protection to be applied. The electrical protection measures and surge protective device applications presented shall be used where electrical protection is required. Other factors, such as those related to telecommunications service reliability, or local codes and standards, may dictate the need for electrical protection measures that exceed those described in this standard.

1.3 Topics Not Covered

The following topics are not covered by this standard:

- Specific electromagnetic interference mitigation designs;
- Requirements for equipment within the facilities;
- Specifications for equipment grounding (earthing) and bonding topologies. Such specifications are covered in ATIS-0600333 [8]*, Grounding and Bonding of Telecommunication Equipment*, clause 8, *Telecommunication Systems Grounding*;
- Device-level specifications for electrical protection apparatus;
- Specifications for power quality or power conditioning;
- Specifications for electrical protection from high-altitude electromagnetic pulse (HEMP) – see ATIS-0600320 [104];
- Electrical protection of telecommunications outside plant -- see ATIS-0600316;
- The customer network interface -- see ATIS-0600318 [103];
- Customer premises equipment; and
- Electrical protection of network operator-type equipment positions – see ATIS-0600321 [105].