ATIS STANDARD

ATIS-0600012.03

ATIS Standard on -

Electrical Protection Considerations for Outdoor Coaxial Cable Runs for DS-3 and GPS Timing Signals

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Published by

Alliance for Telecommunications Industry Solutions
1200 G Street, NW, Suite 500
Washington, DC 20005

ATIS-0600012.03

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Alliance for Telecommunications Industry Solutions

Approved December 12, 2017

Abstract

Relatively short coaxial cable runs of DS-3 and GPS timing outdoors are susceptible to disturbances that may require the use of electrical primary protection devices. Application and selection considerations for the use of these protectors for DS-3 and GPS timing on type 734A, 735A, LA, R-4, 6, RG-59, RG-8, or similar coaxial cables run outdoors are highlighted herein. This document is to be used in conjunction with the master document (ATIS-0600012) for broadband protectors, which describes the attributes of the various protective devices themselves.

Foreword

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 mandatory requirements are designated by the word *shall* and recommendations by the word *should*. Where both a mandatory requirement and a recommendation are specified for the same criterion, the recommendation represents a goal currently identifiable as having distinct compatibility or performance advantages. The word *may* denotes a optional capability that could augment the standard. The standard is fully functional without the incorporation of this optional capability.

Suggestions for improvement of this document are welcome. They 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 and STEP NEP Vice Chair (Ericsson)

J. Fuller, STEP Vice Chair and STEP NEP Chair (AT&T)

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

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1 Scope & Purpose

1.1 Scope

This document provides user guidance for the selection and proper application of protectors for relatively shorter coaxial cable runs outdoors for purposes of transmitting DS-3 or GPS PRS L1 timing signals.

1.2 Background & Purpose

Historically, traditional (non-CATV) telecommunications companies only ran coaxial cable inside their own facilities or inside of a customer's building, primarily to provide DS-3 drops from a mux or DS-3 cross-connects. With the explosion of broadband traffic on wireless networks, higher bandwidth than the traditional T-1s that have served cell towers is needed for backhaul. While the ultimate goal is GigE fiber, not all existing wireless cellsite equipment is capable of that type of interface. In addition, not all cell sites need to carry that much traffic. For at least the next several years, many wireless companies will request DS-3 interfaces from telecommunications backhaul providers. In some cases, these will be run outdoors on coaxial cable. Given that the cell site has a natural lightning attractant (the tower), it makes sense to protect the electronic equipment on both ends of many of these outdoor runs from surges.

A synchronization network (timing) for telecommunications signals has been used since the advent of analog carrier, and became even more important with the evolution of the SONET network, in order to ensure proper signal coordination between both ends of the circuit. Historically, the backbone source of this timing network was provided by a combination of multiple facilities-based cesium clock sources (PRS), as well as external government-provided timing sources (such as LORAN). Several decades ago the U.S. government opened up its GPS satellite network signals for civilian access. The GPS network has several uses besides the obvious location information. One of these is an excellent clock signal provided via the satellite link, but originating in multiple interconnected atomic clock sources that provide official time for various U.S. government organizations. Over the last decade or so, telecommunications providers have been transitioning their synchronization networks to take advantage of this excellent government-provided timing source. Typically, the GPS antenna for synchronization networks sits on a rooftop (or other location with clear access to the satellites) and then communicates with the synchronization gear within the building via a coaxial connection. Because the antenna often sits in a location that is susceptible to lightning strikes, it is wise to protect the expensive electronic synchronization gear within the building from surges that could be carried in via this metallic coaxial connection.

Telcordia publishes GR-2908, *Generic Requirements of Surge Protectors on Coaxial Lines at Customer Premises* [12], and it provides some excellent guidance that is highly useful; however, it was written when the primary focus was on protection of hybrid fiber-coax plant for deployment of TV services to residential customers over RG-6, RG-59, RG-8, etc. – relatively long run (thus more subject to EMI influence) coaxial cable plant with network-powered repeaters. While most of the test procedures of GR-2908[12] are applicable, this document intends to provide additional application guidance for outdoor DS-3 and GPS signals over 734A, 735A, low loss communications coax (such as LMR-400 or other LMR cables), hard-line coax, RG-59, and RG-8 type coax cable with relatively short (typically less than 450 feet) non-repeatered runs.

2 References

The following standards contain provisions which, through referenced in this text, constitute provisions of this ATIS Standard. At the time of publication, the editions indicated were valid (where no edition is indicated, the latest edition