ATIS-0600012.01

ATIS Standard on -

Electrical Primary Protection Considerations for Broadband xDSL Systems

As a leading technology and solutions development organization, the Alliance for Telecommunications Industry Solutions (ATIS) brings together the top global ICT companies to advance the industry's most pressing business priorities. ATIS' nearly 200 member companies are currently working to address the All-IP transition, 5G, network functions virtualization, big data analytics, cloud services, device solutions, emergency services, M2M, cyber security, network evolution, quality of service, billing support, operations, and much more. These priorities follow a fast-track development lifecycle — from design and innovation through standards, specifications, requirements, business use cases, software toolkits, open source solutions, and interoperability testing.

ATIS is accredited by the American National Standards Institute (ANSI). The organization is the North American Organizational Partner for the 3rd Generation Partnership Project (3GPP), a founding Partner of the oneM2M global initiative, a member of the International Telecommunication Union (ITU), as well as a member of the Inter-American Telecommunication Commission (CITEL). For more information, visit www.atis.org.

Published by

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

ATIS-0600012.01

ATIS Standard on

Electrical Primary Protection Considerations for Broadband xDSL Systems

Alliance for Telecommunications Industry Solutions

Approved December 8, 20[illegible]

Abstract:

xDSL Broadband equipment is susceptible to disturbances that require the use of electrical primary protection devices. These primary protectors could have a negative impact on the signal of interest during steady-state conditions as well as during protector switching or clamping operation. The characteristics of these electrical primary protectors and their impact on xDSL broadband signals are considered herein. This is the first communication service platform specific document in a suite of ATIS Standards intended to provide requirements and guidance for the use of electrical primary protectors in various technology architectures. This particular ATIS Standard will address xDSL.

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.

Table of Contents

Table of Figures

Table of Tables

ATIS Standard on –

Electrical Primary Protection Considerations for Broadband xDSL Systems

1 Scope, Purpose, & Application

1.1 Scope

1.1.1 Electrical Protection

The purpose of this ATIS Standard is to assist the service provider in choosing appropriate primary protection methods for xDSL communications circuits. For the purposes of this specification, the definition of a primary protector is a device typically installed by the service provider to mitigate large lightning- and/or AC power-related transients. Additional information on lightning-related transients can be found in Annex A. The primary protector in some instances may be integrated within equipment as a convenience to the service provider. Primary protectors are typically required on outside plant telecommunications circuits per the National Electrical Code® (NEC®) NFPA 70 [10]. This ATIS Standard describes protector characteristics that may impact broadband xDSL systems for outside plant, and inter-building applications and the services running over these links. These protectors are categorized by technology type and configurations. This document describes protectors in their non-operating state and their effect on these services, and also considers the effects of protector response to a surge event and how that operation may affect these services. This is a subtending document and is intended to be used with the Broadband umbrella document and is in support of the Broadband Document, ATIS-0600012[1]. These protectors are designed and installed to protect against both induced lightning and ac power fault events.

It is not the intent of this specification to describe secondary and tertiary protectors and their usage.

1.1.2 Equipment Covered

This ATIS Standard applies to the electrical protection at all xDSL network equipment locations. Examples include: xDSL equipment at Central Office (CO) Type facilities, remote sites, and at the customer location (including the entrance or interface point, and equipment at the customer location). This equipment may interface with various types of cable media, such as coaxial cable or twisted pair that provides the xDSL signal and possible power.

Although a variety of existing and proposed xDSL equipment types are considered, the merits of the different technologies, and/or architecture types are not covered.

The following are examples of equipment/items included in this ATIS standard:

- Primary protectors.
- CO equipment.
- Remote equipment.
- Cell Site equipment.
- NIDs, MINIDs, NIUs, ONTs, BETs, and other points of demarcation.
- CPE such as Set-Top Boxes (STBs), xDSL splitters, telephones, etc.

2 References

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