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January 15, 2013

Tamara Jones
Assistant Director for Government Affairs
Washington State Department of Labor & Industries
P.O. Box 44000
Olympia, Washington 98504-4000

Re: Proposed Revisions to Section 296 of the Washington Administrative Code

Dear Ms. Jones:

I am writing you as Chair of the Alliance for Telecommunications Industry Solution (ATIS) Protection Engineers Group (PEG). I understand that the Washington State Department of Labor and Industries is considering revisions to Section 296 of the Washington Administrative Code pertaining to electrical safety standards, administration and installation (WAC 296-46B). As explained more fully below, ATIS PEG is concerned with one of the proposed revisions to WAC 296-46B.

As a leading technology and solutions development organization, ATIS brings together the major global information and communications technology companies to advance the industry's most-pressing strategic, technical and operational priorities. Through ATIS' technical forums and committees, subject matter experts from telecommunications carriers, and equipment and solution providers work on critical issues that underpin the availability of both traditional and next generation communications services. ATIS PEG is comprised of industry experts in the areas of electrical protection and electrical safety and represents the telecommunications industry on both the NFPA National Electrical Code (NEC) and IEEE National Electrical Safety Code (NESC).

ATIS PEG is concerned that the definition of the term "telecommunications" in the proposed revisions may be too restrictive. As proposed on page 14 of the proposal OTS-5030.4, the term "telecommunications" would be defined to mean:

[A]ny transmission, emission, and reception of data over radio frequency, wire, or optical fiber from a transmitter(s) to a receiver(s). The mode of modulation may be either analog or digital. Telecommunications is not the transmission of any level of electrical power that is used to provide operational power (e.g., relay operation, motor function, lighting power, switching power, device

power, etc.). If a circuit contains both operational power and telecommunications, the circuit is not telecommunications.

ATIS PEG is concerned that this definition could be read to exclude many traditional telecommunications facilities, including T1 and HDSL repeater powering, FTTC/DSLAM line-powering, Power over Ethernet (PoE), and CATV repeater powering via coax. The definition could be read to even exclude old plain old telephone system (POTS) lines, which provide low voltage power to ring the phone and power the handset.

As a result, the proposed rules would establish different and unnecessary requirements pertaining to, for example, the installation of most twisted pair (for traditional landline telecoms) and coax (for CATV companies) facilities than would be established for other telecommunications. These proposed new requirements are not needed for safety reasons as many of these low voltage and power-limited telecommunications facilities have been safely in use for decades (and in some cases more than a century). For example:

- In every twisted pair telecommunications circuit used for POTS (plain old telephone service), in addition to carrying the analog voiceband “telecommunications” signal, the twisted pairs also carry -48 VDC (typically less than 40 mA and 2 W) to power wired phones and wired handsets, and they periodically carry 88 VAC (typically no more than 20 mA and 2 W) to ring some phones. Nominal 48 VDC is under the nominal 50 VDC limit classified by equipment Listed to UL 60950 as “Safety Extra Low Voltage”, and enjoys special exemptions in the NEC, and just about every electrical safety Code in the world (the some exemptions that vary by country, but range from anything under 75 VDC to anything under nominal 50 VDC) due to its very limited ability to cause harm to anyone. This type of “device-powering” on communications circuits has been in use for over 100 years.
- T-1 carrier is still commonly in service (although newer 1.544 Mbps circuits will use HDSL), and there are tens of thousands of these circuits in existence. In addition to the B8ZS-encoded digital/analog signal carried on two twisted pairs, either -130 VDC or ± 130 VDC is also carried on the pairs to power the repeaters and the termination equipment. This power is typically no more than 30 mA and 8 W per pair, and has been safely used for more than half a century. It is governed by Article 830 of the NEC (part of the “Communications” chapter – Article 90.3 in the Code specifically states that Chapter 8 stands alone unless it refers back to Chapters 1-7; and similar language is found in the proposed revisions to the WA rules, as noted previously in this letter.)
- HDSL is the modern equivalent of T-1, and among many other uses is the backhaul medium presently for almost all cellular phone calls. Almost every cell tower has multiples of HDSL lines to support taking the cellular call off the cell tower and onto the

public switched telephone network (PSTN). There are literally millions of these circuits in use. HDSL uses either a single pair or two pair, depending on the type of HDSL, and in addition to the analog “digital” hi-bit rate signal carrier waves, it too has repeaters, which are powered at -190 VDC. There might be as much as 100 mA on a pair (about 20 W). However, per Safety standards (including Telcordia NEBS GR-1089 Chapter 7, UL 60950-21, and NEC Article 830.15), each circuit is equipped with ground fault detection that limits the current to 10 mA (maximum of 2 W) when touched by a human, or any other fault condition occurs.

- Every coaxial CATV cable that travels more than a mile has repeaters that are powered by either 60 VAC or 90 VAC that travels on the center conductor and shield of the coax, while the signal travels in the space between the conductors. This is covered by Articles 820 and 830 in the NEC, once again part of the “Communications” chapter.
- There are many FTTC (fiber to the cell) and DSL systems that are presently powered by “line-powering” at nominal -130 VDC, nominal ± 130 VDC, or ± 190 VDC, and many more systems under consideration for this type of line-powering. In some cases, the signal and the power ride the same pairs, and in some cases, they are separated. Either way, they are both specifically covered and defined as “communications circuits” by Article 830 in the NEC. The safety of these systems is governed by Article 830 in the NEC, Rule 224 in the NESC, Telcordia NEBS GR-1089 Chapter 7, and UL 60950-21. In sum, the power must be limited to 100 W, and ground fault detection limiting current to 10 mA must be provided for 190 VDC circuits.
- There are millions of PoE devices using nominal 48 V power according to IEEE 802.3af (15 W max, with the power being on the unused pairs in a Cat 5 ethernet cable) or 802.3at (30 W max, with the power being on both the unused pairs, and the signal pairs of a Cat 5e cable). The Safety Extra Low Voltage classification of nominal 48 V power has already been discussed.

ATIS PEG understands that the nature of this rulemaking is to adopt the 2014 NEC. ATIS PEG is a member of the NEC Code Making Panel 1, which has responsibility for Article 100 of the NEC. It is ATIS PEG’s opinion that the proposed definition of telecommunications would be in direct conflict with the current version of the NEC. Moreover, it should be noted that the definition of “Communications Equipment” in Article 100 of the NEC is being clarified in the 2014 edition by the addition of a few words (underlined below) that will put the NEC and the proposed definition in even further conflict.

***Communications Equipment.** The electronic equipment that performs the telecommunications operations for the transmission of audio, video, and data, and includes power equipment (e.g., dc converters, inverters, and batteries), technical*

support equipment (e.g., computers) and conductors dedicated solely for the operation of the equipment.

In addition, this proposed definition conflicts with the proposed new language at the beginning of Section 46B-800, which states that:

Chapters 1 through 7, NEC, supplement and modify the requirements of chapter 8, NEC. If there are specific requirements or exceptions described in chapter 8, NEC, that are different from those in chapters 1 through 7, NEC, chapter 8 will prevail.

In other words, the communications circuits (which specifically include line powering – see Article 830) described in Chapter 8 of the Code are not generally covered by the rest of the Code.

In sum, “device powering” over telecommunications lines has been around for over 100 years. Such device powering is extremely widespread and is very safe due to voltage, current, and power limitations imposed by various safety standards. Further regulation by the addition of the language that excludes cables carrying “device power” from being classified as telecommunications circuits is highly unnecessary and costly. ATIS PEG therefore recommends that the proposed definition of “telecommunications” be deleted, or modified to allow minimal power-carrying by telecommunications lines, as allowed presently by the NEC and many other codes and standards.

We would be happy to discuss this further with you. If you have any questions, please feel free to contact the undersigned at egallo@telcordia.com or via telephone at (732) 699-3312.

Regards,



Ernie Gallo
ATIS PEG Chair

Cc: Thomas Goode, ATIS General Counsel