Proposed text for “Environmental” subclause in IEEE P802.3bz D3.1:

George Zimmerman, CME Consulting

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The following text is provided to satisfy sponsor ballot comments:

Insert before PICS. (after 104.7, before 104.8), and add new PICS items as appropriate.

104.7a Environmental

104.7a.1 General safety

All equipment subject to this clause shall conform to IEC 60950-1. All equipment subject to this clause and intended for motor vehicle applications shall conform to ISO 26262.

All equipment subject to this clause may be additionally required to conform to any applicable local, state, or national standards, including national motor vehicle standards related to safety or as agreed to between the customer and supplier.

In particular, the PSE shall be classified as a Limited Power Source in accordance with IEC 60950-1.

104.7a.2 Network safety

This subclause sets forth a number of recommendations and guidelines related to safety concerns. The list is neither complete nor does it address all possible safety issues. The designer is urged to consult the relevant local, national, and international safety regulations to verify compliance with the appropriate requirements. LAN cabling systems described in this clause are subject to at least four direct electrical safety hazards during their installation and use. These hazards are as follows:

a) Direct contact between LAN components and power, lighting, or communications circuits.

b) Static charge buildup on LAN cabling and components.

c) High-energy transients coupled onto the LAN cabling system.

d) Voltage potential differences between safety grounds to which various LAN components are connected.

Such electrical safety hazards should be avoided or appropriately protected against for proper network installation and performance. In addition to provisions for proper handling of these conditions in an operational system, special measures should be taken to verify that the intended safety features are not negated during installation of a new network or during modification of an existing network.

104.7a.3 Installation and maintenance guidelines

It is a mandatory requirement that sound installation practice, as defined by applicable local codes and regulations, be followed in every instance in which such practice is applicable.

In particular, users are cautioned to be aware of the ampacity of cabling, as installed, and local codes and regulations, e.g., ANSI/NFPA 70 – National Electric Code® (NEC®), relevant to the maximum class supported.

It is a mandatory requirement that, during installation of the cabling plant, care be taken to verify that noninsulated network cabling conductors do not make electrical contact with unintended conductors or ground.

All cabling and equipment subject to this clause is expected to be mechanically and electrically secure in a professional manner.

In automotive applications, all PoDL cabling should be routed in way to provide maximum protection by the motor vehicle sheet metal and structural components, following SAE J1292, ISO 14229, and ISO 15764.

Automotive environmental conditions are generally more severe than those found in many commercial and industrial environments. The target automotive, industrial or commercial environment(s) require careful analysis prior to implementation.

104.7a.4 Patch panel considerations

It is possible that the current carrying capability of a cabling cross-connect may be exceeded by a PSE. The designer should consult the manufacturers' specifications to verify compliance with the appropriate requirements.

104.7a.5 Telephony voltages

The use of building wiring brings with it the possibility of wiring errors that may connect telephony voltages to a PSE or PD. Other than voice signals, the primary voltages that may be encountered are the "battery" and ringing voltages. Although there is no universal standard, the following maximums generally apply:

Battery voltage to a telephone line is generally 56 Vdc, applied to the line through a balanced 400 Ω source impedance. Ringing voltage is a composite signal consisting of an AC component and a DC component. The

AC component is up to 175 Vp at 20 Hz to 60 Hz with a 100 □ source resistance. The DC component is 56 Vdc with 300 Ω to 600 Ω source resistance. Large reactive transients can occur at the start and end of each ring interval.

Application of any of the above voltages to the PI of a PSE or a PD in non-automotive applications shall not result in any safety hazard.

104.7a.6 Electromagnetic emissions

The PD and PSE powered cabling link shall comply with applicable local and national codes for the limitation of electromagnetic interference.

In addition, the system may need to comply with more stringent requirements as agreed upon between customer and supplier, for the limitation of electromagnetic interference. In automotive applications, a PoDL system shall be tested according to CISPR 25 test methods, and shall meet the following motor vehicle EMC requirements:

a) Radiated/Conducted Emissions: IEC CISPR 25, IEC 61967-1/4, and IEC 61000-4-21

b) Radiated/Conducted Immunity: ISO 11452, IEC 62132-1/4, and IEC 61000-4-21

c) Electrostatic Discharge: ISO 10605 and IEC 61000-4-2/3

d) Electrical Disturbances: IEC 62215-3 and ISO 7637-2/3

Exact test setup and test limit values may be adapted to each specific application, subject to agreement between the customer and the supplier.

104.7a.7 Temperature and humidity

The PD and PSE powered cabling link segment is expected to operate over a reasonable range of environmental conditions related to temperature, humidity, and physical handling. Specific requirements and values for these parameters are beyond the scope of this standard.