

Subject: Proposed revision of Lot 7 External Power Supplies (EPS) Regulation

From: IEEE 802.3 Ethernet Working Group¹

CC: Secretary, IEEE-SA Standards Board,
Secretary, IEEE-SA Board of Governors

Dear Sir or Madam,

The IEEE 802.3 Ethernet Working Group is grateful for the opportunity to provide feedback regarding the proposed revision of Lot 7 External Power Supplies (EPS) Regulation.

The IEEE 802.3 Ethernet Working Group is the subgroup of the IEEE 802 LAN/MAN Standards Committee responsible for developing the IEEE 802.3 Ethernet standard that specifies Ethernet local area, access and metropolitan area networks at selected speeds of operation up to 800 Gb/s as well as the provision of power over selected twisted pair PHY types commonly referred to as Power over Ethernet (PoE).

The IEEE 802 LAN/MAN Standards Committee (IEEE 802 LMSC) is a leading consensus-based open standards development committee for networking standards that are used by industry globally. It produces standards for networking devices, including wired and wireless local area networks ("LANs" and "WLANS"), wireless specialty networks ("WSNs"), wireless metropolitan area networks ("Wireless MANs"), and wireless regional area networks ("WRANS").

Technologies produced by implementers of our standards are a critical element for all networked applications today. IEEE 802 LMSC is a committee of the IEEE Standards Association and of Technical Activities, two of the Major Organizational Units of the IEEE. IEEE has about 400,000 members in over 160 countries and its core purpose is to foster technological innovation and excellence for the benefit of humanity. IEEE is also a major accredited standards development organization whose standards are recognized worldwide. In submitting this document, IEEE 802.3 Ethernet Working Group acknowledges and respects that other components of IEEE Organizational Units may have perspectives that differ from, or compete with, those of IEEE 802.3 Ethernet Working Group.

Please find below the IEEE 802.3 Ethernet Working Group's feedback regarding the proposed revision of Lot 7 EPS Regulation.

Respectfully submitted

By: /ss/.

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¹ This document solely represents the views of the IEEE 802.3 Working Group and does not necessarily represent a position of the IEEE, the IEEE Standards Association, or IEEE 802.

The IEEE 802.3 Ethernet Working Group notes that it appears that Power over Ethernet Midspan Power Sourcing Equipment (PSE), referred to as 'active Power over Ethernet (PoE) injectors', appear to be no longer exclude from the scope of the Proposed revision of Lot 7 External Power Supplies (EPS) Regulation.

An IEEE 802.3 power supply, referred to as Power Sourcing Equipment (PSE), first goes through a detection process to confirm that an IEEE 802.3 PoE load, referred to as a Powered Device (PD), is connected before applying power. The PSE performs this detection by applying two voltages, a minimum of 1.0 V apart, in the range of 2.8 V to 10 V volts with an open circuit limit of 30 V. The supply voltage will only increase above these limits to the power on range of 44 V to 57 V if the detection process succeeds.

There are two reasons for this detection process. The first is to avoid potential damage as a result of applying the power on voltage to a non-IEEE 802.3 PoE load or to a non-PoE capable device. The second is to address the limit of 30 V on user-accessible conductive parts found in the Harmonised standard IEC 60950-22 'Information technology equipment – Safety – Part 22: Equipment installed outdoors'.

Therefore, the above requires that PoE injectors continually perform the detection process (typically a digital core with associated analogue interface circuitry) to see if a valid load has been connected during the no-load conditions.

PoE injectors have a use case that is significantly different from other EPS covered by the regulation. They are typically installed to support always on infrastructure devices such as Wireless Access Points, Internet Protocol Telephones, and Security Cameras rather than charge consumer products such as mobile phones. Typically, an injector is installed as a pair with a PD and not disconnected for the life of the installation.

As a result of this use case, the IEEE 802.3 Working Group believes that the no-load power consumption of the internal detection process was not a primary design consideration, with internal detection process often powered by the power on voltage. As a result, the IEEE 802.3 Working Group believes that most, if not all, active PoE injectors would not be able to meet the meet the no-load requirements of the revised regulation. The Working Group estimates that it would be at least four years before redesigned active PoE injectors would be generally available on the market.

In accordance with the above, the IEEE 802.3 Ethernet Working Group recommends that active PoE injectors be explicitly kept out of the scope for this revision of the regulation for energy efficiency requirements. If there is a desire to include active PoE injectors within the scope of the energy efficiency requirements of this regulation, it should be done with enough notice for the industry to prepare.

It would be beneficial to the industry for a future revision to the regulation to clearly address key issues that affect PoE. First, it should be made explicit that the primary load of a PoE switch is the Ethernet data switching function. Second, the regulation should make it clear that the USB-PD reuse requirement cannot apply to an EPS that supplies power at a distance that exceeds the USB-PD specification, such as Ethernet links which have a reach of up to 100 m. Finally, it should be clear that USB-PD supplies are not required to be the power source for an active PoE injector (i.e. a two-piece design) as USB-PD does not provide sufficient voltage and isolation to meet the IEEE 802.3 PoE requirements.

