

# PSE current limiting v110

## Info (not part of baseline)

**Draft 3.3:** The PSE shall limit a pairset current to  $I_{LIM-2P}$  for a duration of up to  $T_{LIM}$ .

**Draft 3.4:** The PSE shall limit the pairset current to  $I_{LIM-2P}$  for a duration of at least  $T_{LIM}$ .

This change was made because the construct “up to  $T_{LIM}$ ” makes the entire requirement optional. Furthermore, the PD is dependent on the PSE limiting current during transients to successfully ride out voltage transients. In draft 3.4 however, we now have conflicting requirements / statements:

page	line	
181	33	A PSE may remove power from the PI if the current on any pair meets or exceeds the “PSE lowerbound template” in Figure 145–23 or Figure 145–24.
183	26	The PSE shall limit the pairset current to $I_{LIM-2P}$ for a duration of at least $T_{LIM}$ .
184	1	If a short circuit condition is detected on a pairset, power removal from that pairset shall begin within $T_{LIM}$ as defined in Table 145–16.
184	2	If $I_{Port-2P}$ exceeds the PSE lowerbound template, the PSE output voltage may drop below $V_{Port,PSE-2P}$ min.
184	5	A PSE in a power on state may remove power from that pairset without regard to $T_{LIM}$ when the pairset voltage no longer meets the $V_{Port,PSE-2P}$ specification.

So what do we need?

- The PSE needs to limit current to  $I_{LIM-2P}$  for **at least**  $T_{LIM}$  in order for the PD to be able to deal with transients
- The PSE should not be required to limit the current when there is a short on the PI, that would require it to be able to dissipate huge amounts of power
- The PSE must remove power when there is a short circuit condition between  $T_{LIM-2P}$  min and  $T_{CUT}$  max.  
This is consistent with the requirements of Clause 33.

## Proposal

If  $V_{PSE} > V_{Tran-2P}$  the PSE is required to limit to current for at least  $T_{LIM}$ , however if  $V_{PSE} < V_{Tran-2P}$  it may shutdown immediately and is required to shutdown between  $T_{LIM-2P}$  min and  $T_{CUT}$  max. Such a proposal would seem to be in line with the original intention of 802.3at.

## 145.2.10 Power supply output

*Set the maximum value of  $T_{LIM}$  (for both Types), item 12 in Table 145–16, to the value “75”.*

## 145.2.10.8 Short circuit current

A PSE may remove power from the PI if the current on any pair ~~meets or~~ exceeds the “PSE lowerbound template” in Figure 145–23 or Figure 145–24. Power shall be removed from a pairset of a PSE before the pairset current exceeds the “PSE upperbound template” in Figure 145–23 or Figure 145–24. When connected to a single-signature PD, the PSE should remove power from both pairsets before the current exceeds the “PSE upperbound template” on either pairset.

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The PSE shall limit the pairset current to  $I_{LIM-2P}$  for a duration of at least  $T_{LIM}$  min, when  $V_{PSE}$  is greater or equal to  $V_{Tran-2P}$ . The cumulative duration of the current limit event may be measured with a sliding window of at most 1 second width.

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A short circuit condition occurs when the pairset voltage,  $V_{PSE}$ , is less than  $V_{Tran-2P}$ , during a power on state, and the PSE is limiting the output current. If a short circuit condition is detected on a pairset, power removal from that pairset shall begin within  $T_{LIM}$  as defined in Table 145–16. If  $I_{Port-2P}$  exceeds the PSE lowerbound template, the PSE output voltage may drop below  $V_{Port,PSE-2P}$  min.

A PSE in a power on state may remove power from that pairset without regard to  $T_{LIM}$  when the pairset voltage no longer meets the  $V_{Port,PSE-2P}$  specification.