PSE current limiting v120

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}~~ T_{LIM-2P} min. 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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If $I_{Port-2P}$ exceeds the PSE lowerbound template, the PSE output voltage may drop below V_{Port_PSE-2P} min.

A PSE shall remove power from a pairset within T_{LIM-2P} max when that pairset has been in a current limiting condition continuously.

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}~~ $V_{Tran-2P}$ specification.