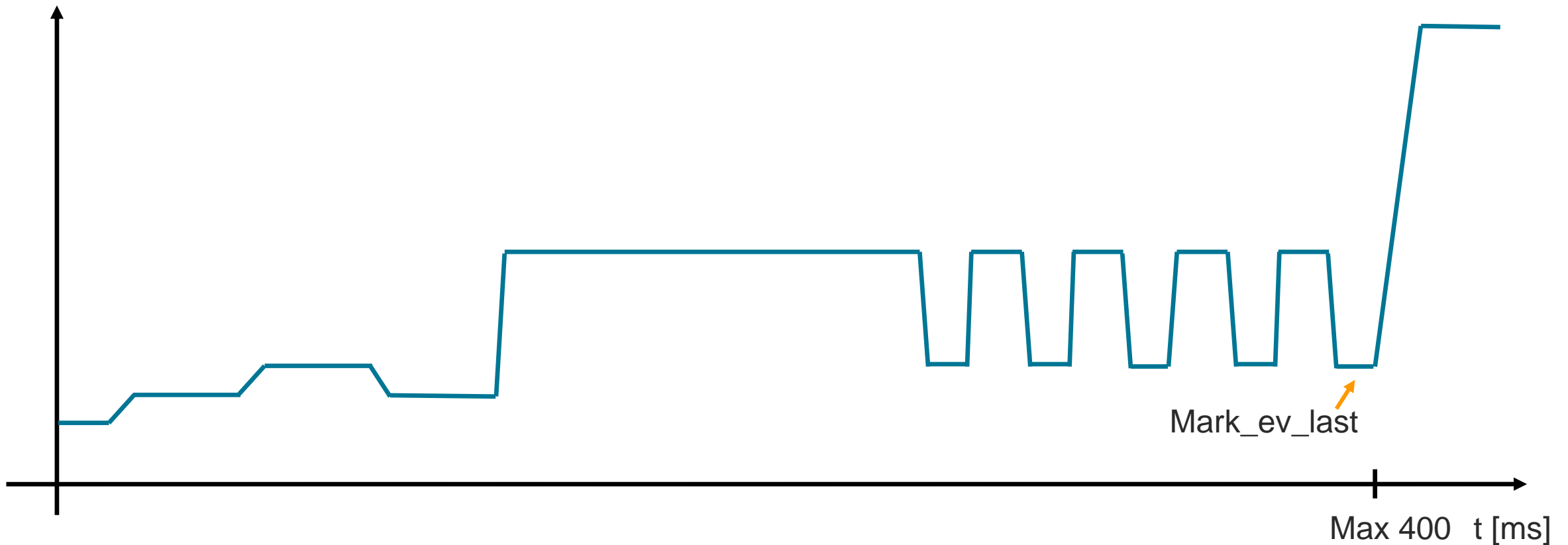# Mark & Hold

Miklos Lukacs, April 2017

Adding a technical feature now !?

- We are about to go to Sponsor Ballot, the time to add new features has passed.

- BUT...

- Mark & Hold is an easy to implement feature that offers wide benefits

- Only requires changes on the PSE side – NO modifications to PD section

- Plan:
  - Discuss the concept – May
  - Create baseline for review in July
 - Final decision to adopt it - September

What is Mark & Hold – Tpon today

- PSE must turn on the PD, max Tpon (400ms) after the end of detection.

- This restriction exists to prevent a PD from being swapped with another device (similar to TMPDO).

Mark_ev_last

Max 400   t [ms]

What is Mark & Hold

- Mark & Hold allows a PSE to delay POWER_ON
- The PSE can extend MARK_EV_LAST and choose the POWER_ON moment
- PSEs will check the mark current to detect PD disconnects

Yair: The problem that I see is that the MARK EVENT current is very small 0.25mA to 4mA which is to small for PSE to detect in reliable way. The noise floor for PSE systems is 1mA min. In DC disconnect is 10mA min. Any how this is implementation issue and if PSE can detect such low current then it is OK. It is optional feature correct?

Check PD disconnect

Mark_ev_last - Flexible turn on timing

t [ms]
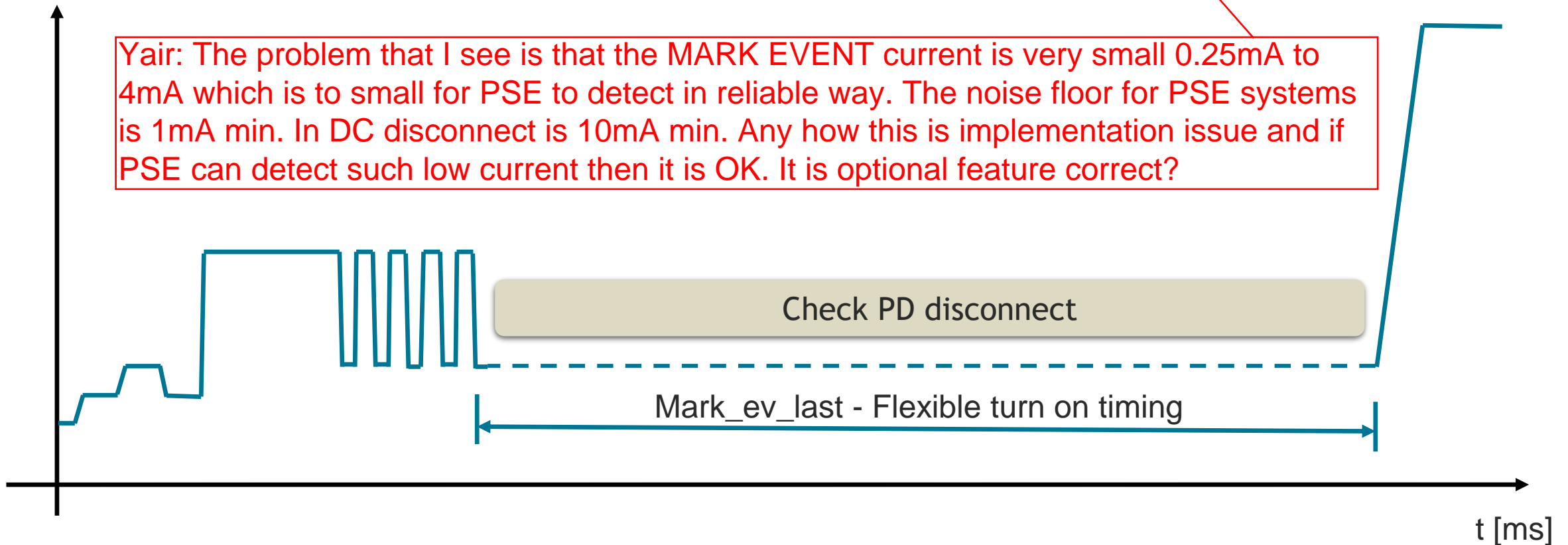
Benefits

- Get all PDs turned on faster in multi-port PSEs

- Simultaneous turn on of both pairsets of a dual signature PD

- Deep sleep mode is possible for PDs and PSEs, with fast turn-on

- Synchronized multi-port turn-on

Yair: Why faster? per your presentation it allows to prolong TPON

Yair: Very good feature!!!!!

Yair: Not sure that this is a good thing however YES if you want to do it, it allows it.

Benefits in detail – not to present this slide

- Multi port PSEs can get all of the connected PDs turned on faster

- PSE can wait in the Mark & Hold state until it gets permission from the host controller to turn on the port, and doesn't need to wait until the next window

- Also saves power (no repeated cc-det-class like today in semi-auto mode)

- Allows simultaneous turn on of both pairset of a dual signature PD with PSEs having shared resources

- Holding the PD in mark consumes very little power, but allows to turn on instantaniously – creates a deep sleep mode option for the PDs

- Synchronized turn on useful for PoE lighting – helps to avoid the visually unpleasant turning on in a semi-random fashion
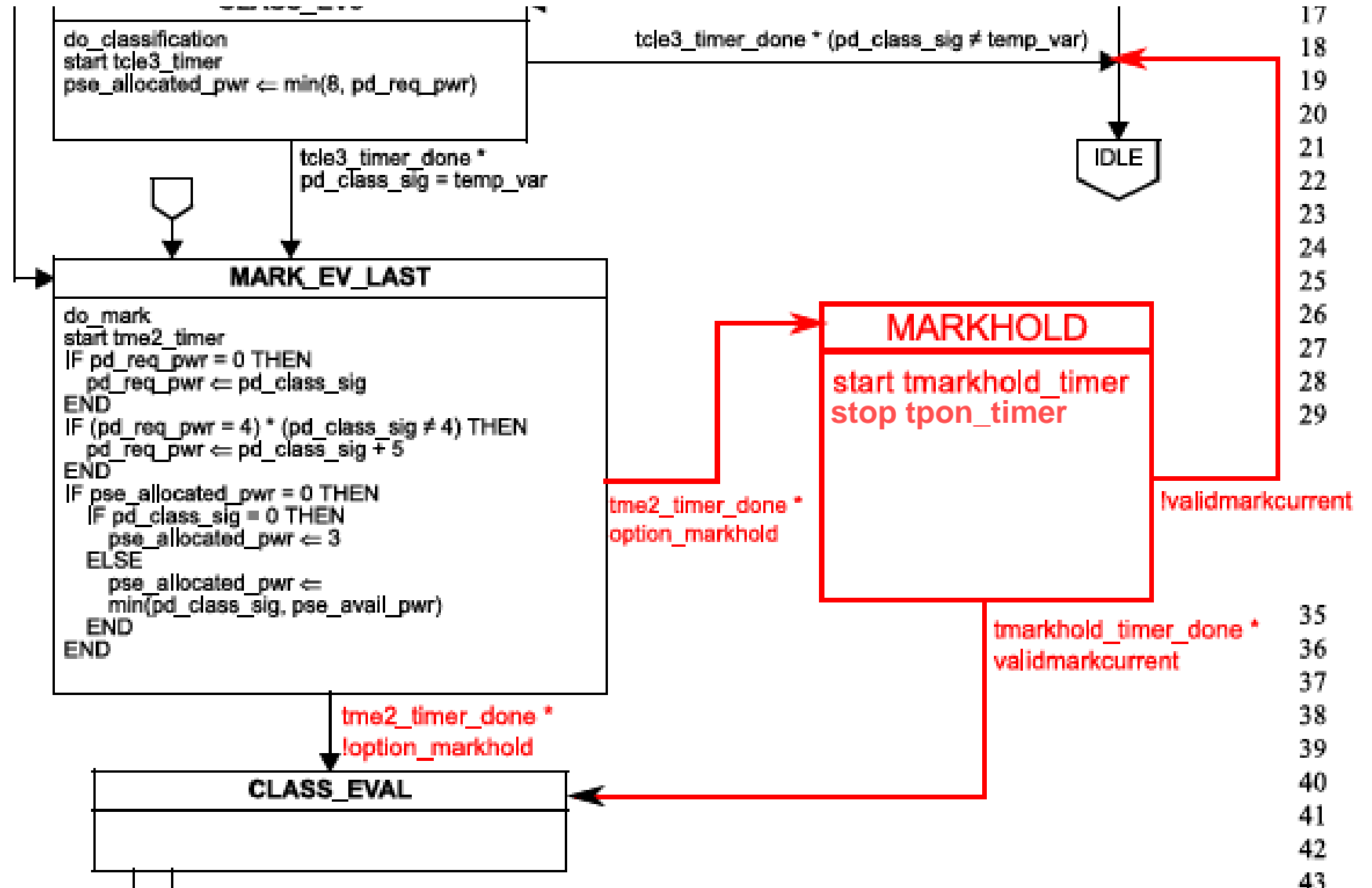
What do we need to change ?

- PSE Changes:
  - Add a "waiting" state to the PSE classification state diagram – „MARKHOLD"
  - Change normative text that restricts turn on to within Tpon of detection
  - Set rules for disconnect detection during MARKHOLD state
  - Stop Tpon timer when entering to MARKHOLD.

- PD Changes
  - None

PSE State Machine change

Check PD Disconnect – in MARKHOLD state

- Tpon prevents a device to be powered if the device is swapped right after detection

- Same level of protection needs to stay in effect

- Tpon to apply either to powering the PD, or to reaching the MARKHOLD state

- In the MARKHOLD state, PSE checks for PD disconnect by looking for MARK current or detection current

- Details on how to check if PD has disconnected
    - 100ms ≤ cycle time ≤ 300ms
    - Current always has to be >250uA