

# IEEE P802.3bt PSE State Diagram Update

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# Outline

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- Introduction
- PSE States
- Diagram Hierarchical Concept
- Diagram Transition Simplification



## Introduction

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- First, we create a high-level state diagram with blocks defined by the management status register.
- Next, we identify all arcs in the existing PSE state diagram with numbers.
- Next, we build a top-level block diagram showing all of the relevant arcs between those blocks
- Then we redraw the individual blocks with arcs coming in, exiting.

# Defining Blocks & Identifying Arcs

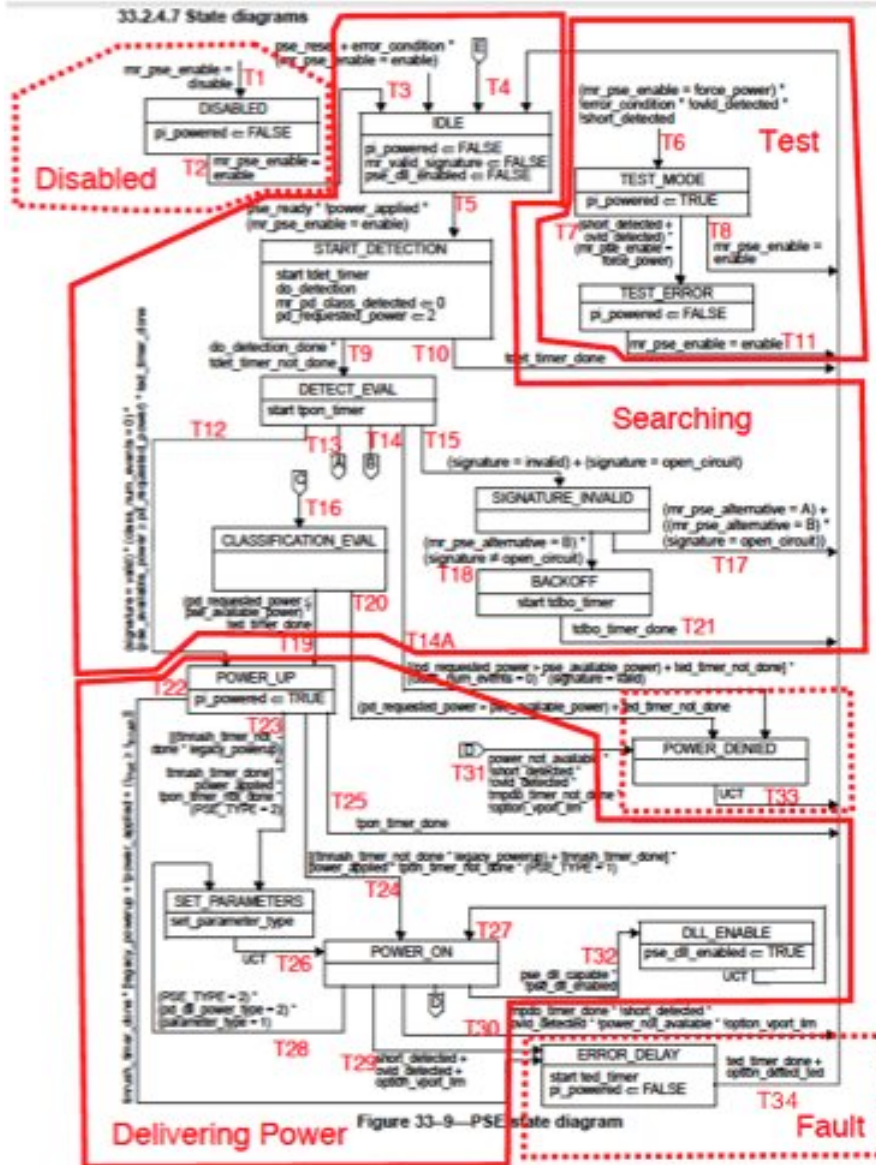


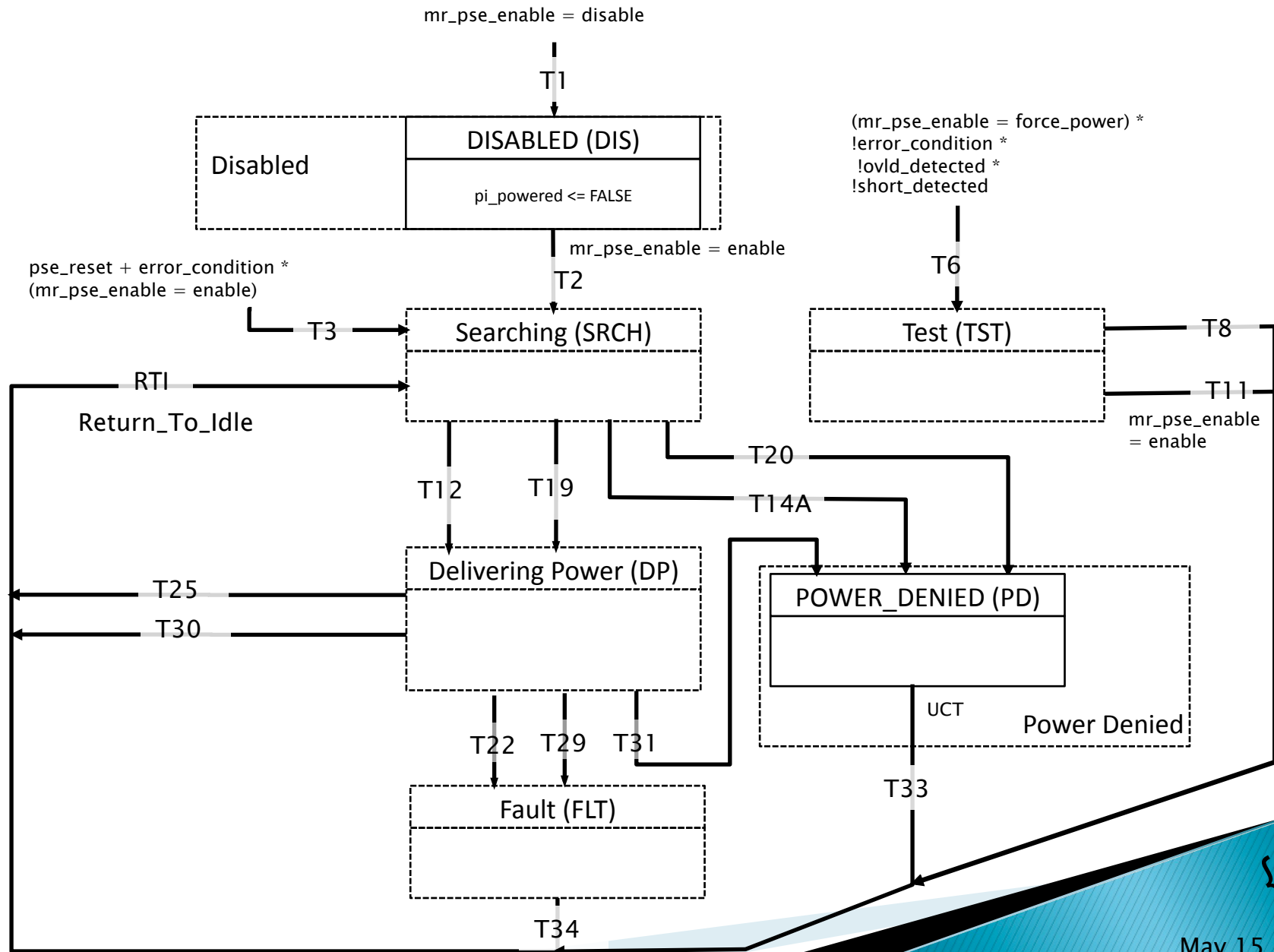
Image taken from  
IEEE P8023bt-33\_D0p2

4/6/2015

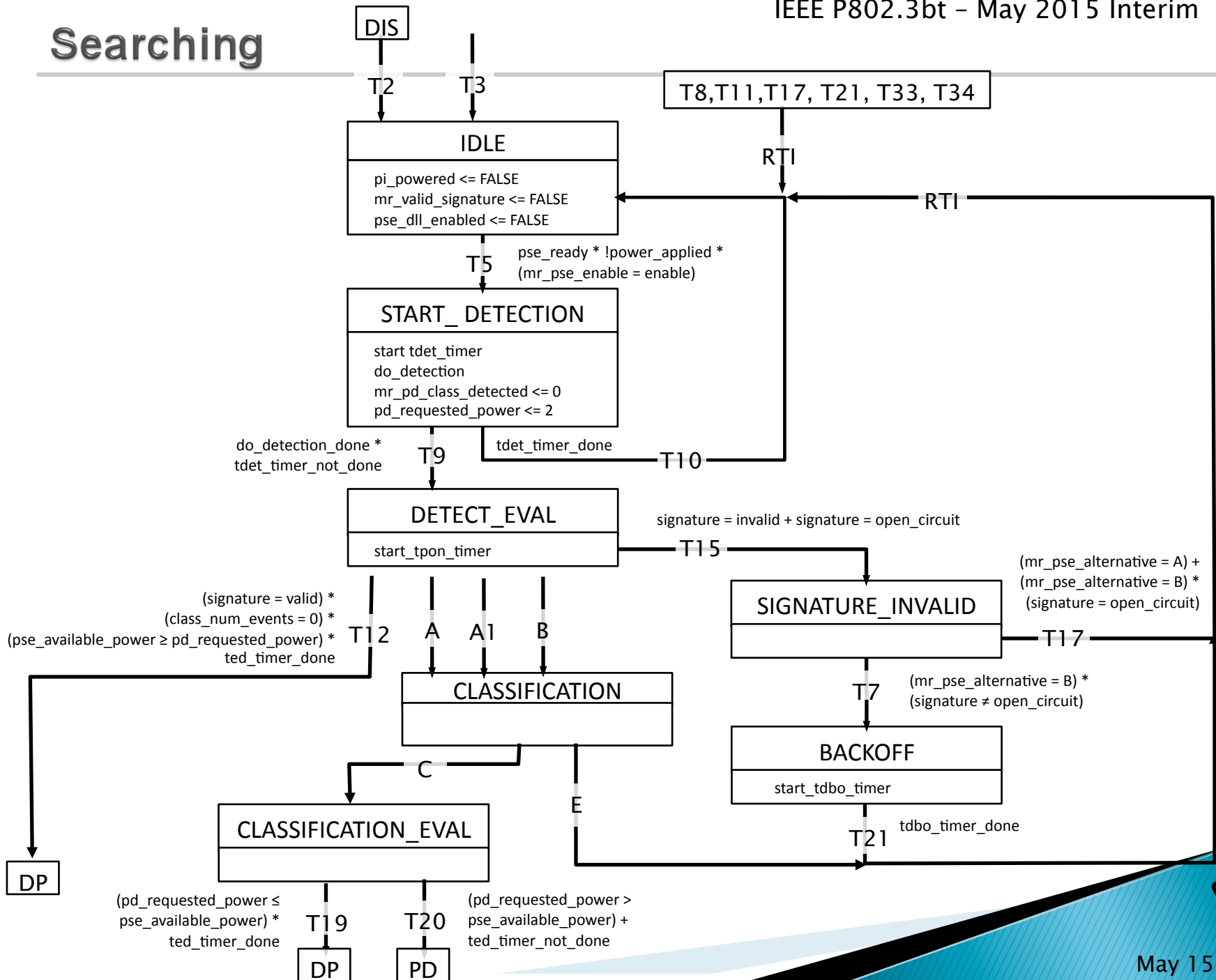
Removed T35

Moved T34 (already T27) to Fault  
output to RTI (Formerly T35)

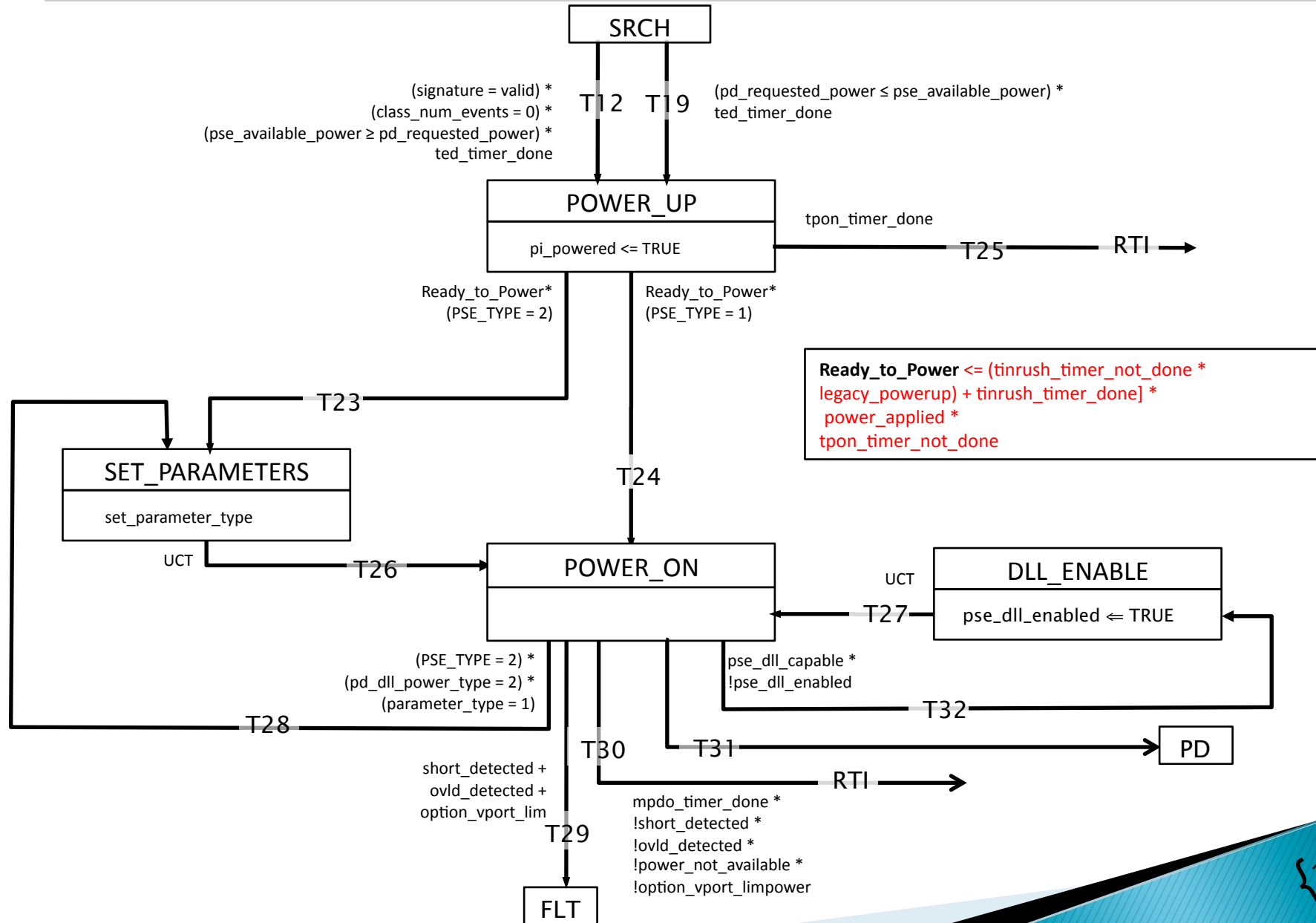
# High Level State Diagram



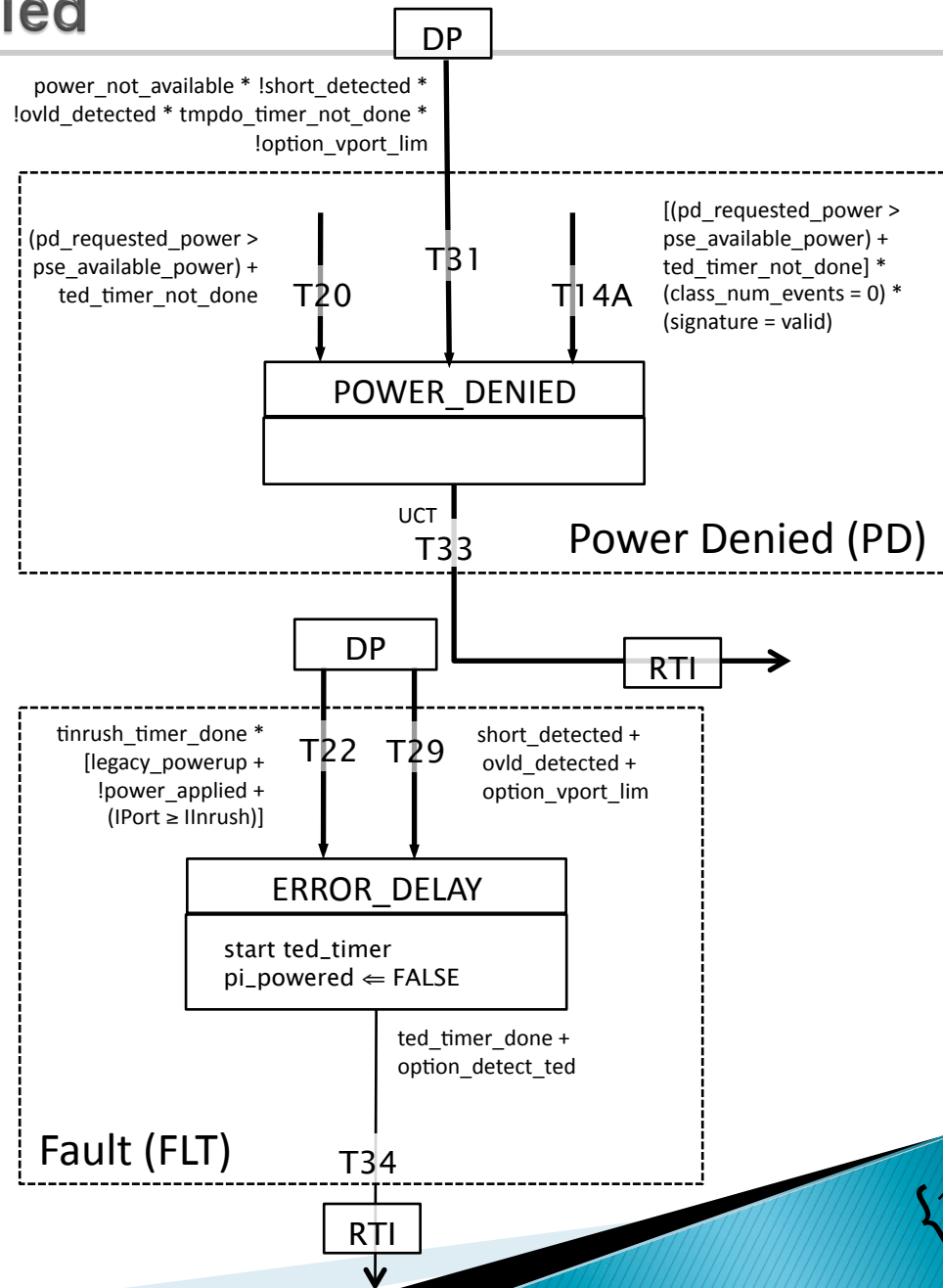
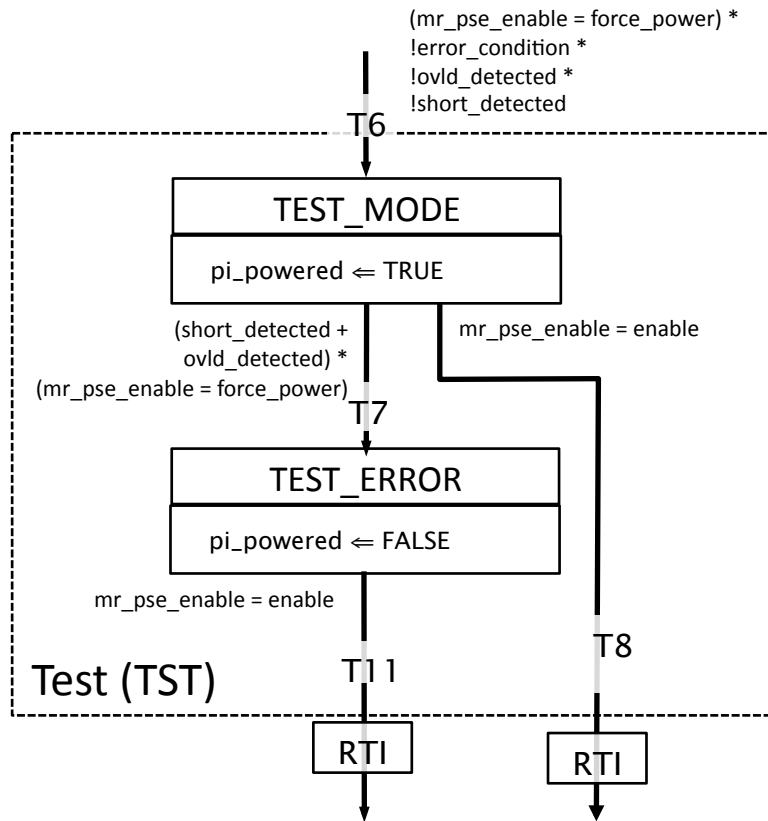
# Searching



# Delivering Power



# Test, Fault & Power Denied





# Diagram Transition Simplification

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- Identify transition terms that are either common or very complex
- Define new logic terms and then describe that logic in the State Diagram Variables
- Define a common node (RTI) to simplify diagram

Examples:

## Complex:

**Ready\_2\_Power** = [(tinrush\_timer\_not\_done \* legacy\_powerup) + tinrush\_timer\_done] \* power\_applied \* tpon\_timer\_not\_done

- Makes T23 = Ready\_2\_Power \* (PSE\_TYPE = 2)
- Makes T24 = Ready\_2\_Power \* (PSE\_TYPE = 1)

## Common:

**Enable\_Pwr** = (mr\_pse\_enable = enable)

**Disable\_Pwr** = (mr\_pse\_enable = disable)

- Simplifies and reduces many terms in readability/size

**RTI** = Node called “Return To Idle” which is extremely common node in that many states lead to it. Much simpler than showing 8+ arcs all going into IDLE state.



## Comments

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- This is a “Work in Progress” and expected to draw some constructive criticism, recommendations, etc.
- The outcome if adopted, would be to have multiple diagrams in the specification rather than a single two-page diagram, but these diagrams will be smaller, easier to understand, and easier to modify to accept future changes.
- The classification portion of the existing PSE State Diagram is assumed to be the current page pretty much as is.
- A few minor modifications have been made that are assumed to be errors.
  - A typo taken out of T23 (removed hyphen)
  - A1 arc added to “Searching” block since it appears as entry into the Classification State
- It’s the author’s opinion, that a good specification is done from the top down, rather than the bottom up. The existing PSE state diagram, while it accurately represents behavior of a PSE, appears to have been designed from the bottom up to explain PSE behavior, rather than to direct design.
- I look forward to further discussion on this approach.