

Proposal of modifications for PCS receiver function

(Detail description for comments to draft 1.1)

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Outline

1. Block synchronization state machine
(related with comment #993)
2. Replacing uncorrectable blocks
(related with comment #994)

Block synchronization state machine

(1) Clarifying the issue (Possible 2 items mainly)

Conditions for sh_cnt : no problem

In the comment #993, I meant that additional conditions for sh_cnt and sh_invalid_cnt are needed. The conditions should be considered for sync header for parity blocks. But, it was my misunderstanding issue. I found that it is described in 92.2.4.6.1 and 92.2.4.6.2.

Force() function : some problems

In Draft 1.1, the function of Force() is described as follows.

Forces the sync header to the state that preserves FEC frame lock. Note that for parity blocks, the pattern is known a priori. For payload blocks, the first bit is forced to be the complement of the second bit. While this may duplicate a bit error, it will not propagate, as the FEC decoder discards the first bit before decoding.

So the purpose of the Force() are 2 items as below.

Preserving FEC frame lock (lock state machine)
Helping FEC decoder operations

Block synchronization state machine

But, forcing the sync header

a) For lock state machine : It has no concerns.

The state machine always checks new sync header before forced by the function.

b) For FEC decoder : There are 2 possible merits. But actually no meaning.

i) To show FEC frame timing

(forcing the last sync header pattern to “11”)

-> Not necessary. It decreases implement choices.

Because there are several ways else to show the timing of FEC frame.

(showing the first sync header, asserting timing pulse, etc.)

ii) To improve FEC decoding characteristics (output BER).

-> Not effective. The reasons are as follow.

In data block :

Probability of bit error at rx_coded<0> is same as rx_coded<1>

In parity block :

Out of FEC range

If there are no effects, “raw” data is better than forced data, isn't it ?

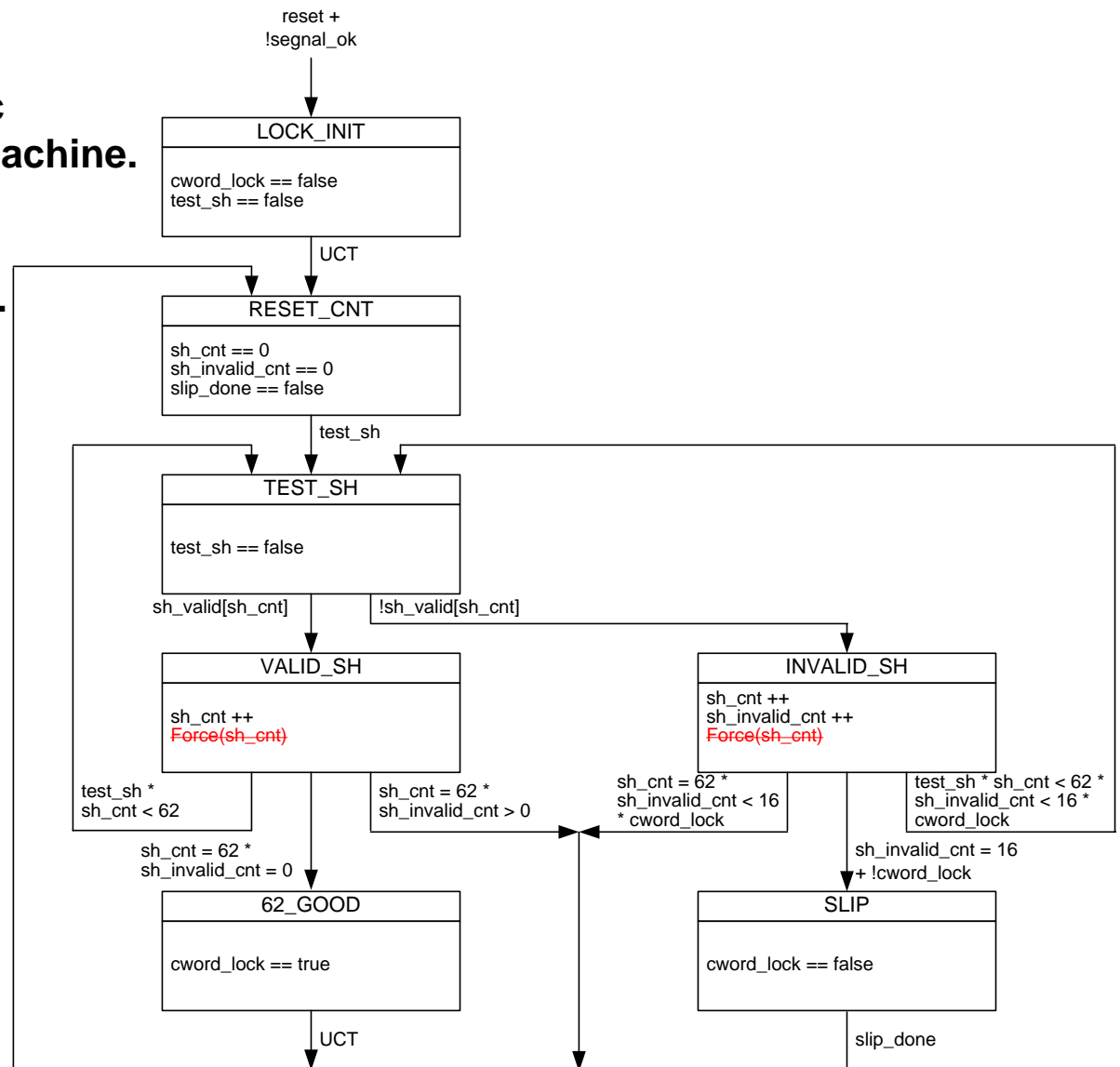
Block synchronization state machine

(2) Proposal of modification

1. Remove the function of forcing sync header in the operation of lock state machine. (as shown by right figure)

2. Remove the 4th sentence in 92.2.4.1. (line #22 - #28)

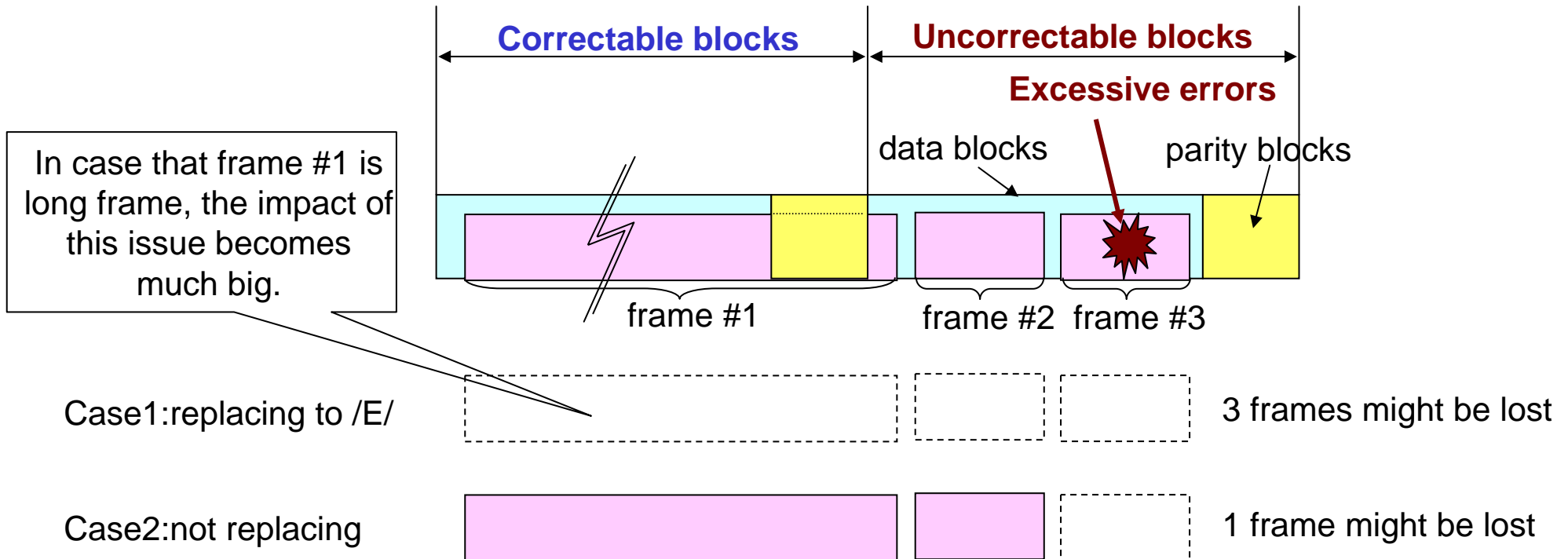
3. Remove the sentence in 92.2.4.6.3, corresponds to the function. (line #37 - #54 and #1 in next page)



Replacing uncorrectable blocks

(1) Clarifying the issue

The function replacing uncorrectable blocks with /E/ blocks should not be mandatory.
In case shown as below, 2 correct frames might be discarded.



(2) Proposal of modification

Change "must" into "might"

The replacing function to be optional