

**Agenda Item:** Sync Ad Hoc 4.8

**Source:** Ericsson

**Title:** Liaison to WG1 to consider by WG3: Number of SFN bits needed in each radio frame over BCH

**Document for:** Liaison for a proposal to be written by WG1

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## 1. Introduction

The SFN counter is at present  $B = 16$  bits long but a proposal exist to change this to 12 bits. However, it is not obviously necessary for each cell to broadcast these  $B$  bits in every BCH radio frame. The number of bits needed on BCH in every radio frame is related to soft handover, and depends on the maximum possible ambiguity in node synchronisation between RNC and Node Bs and data frame transport delay differences.

It seems reasonable to assume that this value is not greater than the Connection Frame Number (CFN), which is 7 bits.

## 2. Discussion

In principle, we can partition  $B$  into  $B = M$  (msb) +  $L$  (lsb) bits, where  $L$  is the number of bits needed to be transmitted within every radio frame. The remaining  $M$  bits are related to, e.g., paging and is not needed for Soft Handover. This means that they may be transmitted within  $X$  ms. Currently, it is a WG1 assumption that  $B$  bits ( $M+L$ ) are transmitted on BCH every radio frame. Two alternatives are presented as examples, other alternatives are possible.

Alternative 1: If we assume that  $L=7$  (corresponding to the length of CFN), then  $M=5$  (assuming SFN of 12 bits).

Alternative 2: Use  $L=4$ . The RNC can handle the remaining 3 bits needed for calculations of offsets during soft handover. This is possible if the node synchronism (SRNC - NodeB) is known to a degree better than  $\pm 8$  frames.

## 3. Proposal

- a. WG3: Does UE need to report the full CFN length offset between cells at handover (alternative 1) or could UTRAN partly handle the offset calculation (alternative 2) ?
- b. WG1: Could you propose a scheme where the  $L$  bits are transmitted (and incremented) on BCH in every radio frame, while the  $M$  bits are transmitted on BCH over a number of radio frames?