Agenda Item:	14.1
Source:	Nokia
Title:	**DCH Control Frames Structure**
Document for:	Approval

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1   Introduction

This contribution proposes the frame content for control frames in dedicated channel.

2   Discussion

As stated in [S3.27], DCH control frames are used to carry in band signalling between SRNC and Node B when normal DCH data frames cannot be utilised, i.e. there is no data to be transferred.

The typical uses for control frame are:

a)   *Initial synchronisation of the user plane*. As soon as a new user plane is setup, the SRNC starts sending DL control frames that includes a CFN. The Node B maps this CFN with the correspondent cell FN, and if the timing is not correct, it requests a timing adjustment with an UL control frame. This procedure is started before that the channel come into use (i.e. before the RC command to the MS), and may require more iterations. This use is already described in [S3.27].

b)   *Timing adjustment command*. If, during the normal activity of one dedicated channel connection, the node B starts receiving data in advance or delayed respect the preferred arrival time, it sends UL Timing Adjustment request, and in case no UL data frame is being transmitted (ex. DTX), the request is carried by a control frame. This use is already described in [S3.27].

c)   *Outer loop power control command*. SRNC evaluates the quality of the UL connection and, based on this evaluation, sends inband commands in DL in order to modify the Eb/No setpoint. Normally the commands are included in DL data frames, but in case there are no DL data frames, DL control frames are used. The outer loop power control parameter is already present, as optional parameter, in the DCH frame structure in [S3.27].

Note that the UL control frames are not combined by the MDC unit (in most cases they are originated only by one radio link of the connection), while the DL control frames are split by MDC to all the Node-Bs.

3   Proposals

1.   To include the following text and table in [S3.27], section 7.2.1 (Uplink Control Frame)

Uplink control frames are used for user plane synchronisation: Node B use UL control frames to request for a timing adjustment to the SRNC.

Other use are FFS.

Uplink Control frames are not combined by the MDC units..

Information element	Description
message type	Uplink DCH control frame
CFN	CFN of the frame that trigger the Timing Adjustment request.
Timing adjustment command	Indicates to the SRNC the required timing adjustment.

1. To include the following text and table in [S3.27], section 7.2.2 (Downlink Control Frame)

    Downlink control frames are used for:

    - *Initial user plane synchronisation. SRNC sends DL control frames in order to achieve the initial synchronisation of the user plane via timing adjustment procedure.*

    - *Outer Loop power control command: SRNC includes the information about the variation of the Eb/No setpoint in the DL control frames.*

    In MDC unit, DL control frames are split to all the Node-Bs like DCH data frames.

Information element	Description
message type	Downlink DCH control frame
CFN	Used to evaluate the DL data transmission timing
Eb/No Setpoint Control Information (optional)	To update the target outer loop power control

4   References

[S3.27]:   *Iur/Iub interface user plane protocol for DCH data streams*, v.0.0.2. source Editor