CR-Form-v4

CHANGE REQUEST

| ⌘ | **25.214 CR 180** | ⌘ | ev | **3** | ⌘ | Current version: | **3.6.0** | ⌘ |

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘   (U)SIM ☐   ME/UE **X**   Radio Access Network **X**   Core Network ☐

Title:	⌘	Clarification of synchronisation procedures

Source:	⌘	Nortel Networks, Ericsson, Panasonic

Work item code:	⌘		***Date:*** ⌘	06-08-2001

Category:	⌘	**F**	***Release:*** ⌘	R99

Use one of the following categories:	*Use one of the following releases:*
F *(correction)*	*2 (GSM Phase 2)*
A *(corresponds to a correction in an earlier release)*	*R96 (Release 1996)*
B *(addition of feature),*	*R97 (Release 1997)*
C *(functional modification of feature)*	*R98 (Release 1998)*
D *(editorial modification)*	*R99 (Release 1999)*
Detailed explanations of the above categories can	*REL-4 (Release 4)*
be found in 3GPP TR 21.900.	*REL-5 (Release 5)*

Reason for change:	⌘	Synchronisation procedures as described in section 4.3 25.214 currently considers only the establishment and radio link addition cases and nothing is specified for the reconfiguration cases. The CR clarifies in which case the existing procedures can be used and how the UE and UTRAN should behave in terms of synchronisation.

Summary of change:	⌘	The synchronisation procedures "no existing radio link" (section 4.3.2.2) and "one or several existing radio links" (section 4.3.2.3) are renamed "synchronisation procedure A and synchronisation procedure B
		-Synchronisation procedure A applies when at least one downlink dedicated physical channel and one uplink dedicated physical channel are to be set up on a frequency and none of the radio links after the establishment/reconfiguration existed prior to the establishment/reconfiguration. This corresponds to inter-RAT, inter-frequency handover and intra-frequency hard-handover It should be noted that a intra-frequency intra-cell handover is not considered as a hard handover as the radio link(s) are maintained.
		-Synchronisation method B applies in the case one or several radio links are added and at least one radio link from before the reconfiguration is maintained; This is to clarify that an active set update message will effectively lead to procedure B is one link is maintained, so this is not a hard handover.
		Merge with CR25.214-174 (R1-01-0498) for the changes contained in section 4.3.2.3.

Consequences if not approved:	⌘	Unclear specifications, ambiguous UE and UTRAN behaviour as far as synchronisation is concerned when physical channel reconfigurations occur, in particular for handover cases (inter-frequency, intra-frequency hard handover) compared to other cases of physical channel reconfiguration. As which synchronisation procedure is to be applied by UE and UTRAN are not clear there

		is significant risk that they apply different procedures.

Clauses affected:	⌘	4.3.2 and subclauses		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4.3 DPCCH/DPDCH synchronisation

4.3.1 Synchronisation primitives

4.3.1.1 General

For the dedicated channels, synchronisation primitives are used to indicate the synchronisation status of radio links, both in uplink and downlink. The definition of the primitives is given in the following subclauses.

4.3.1.2 Downlink synchronisation primitives

Layer 1 in the UE shall every radio frame check synchronisation status of the downlink dedicated channels. Synchronisation status is indicated to higher layers using the CPHY-Sync-IND and CPHY-Out-of-Sync-IND primitives.

The criteria for reporting synchronisation status are defined in two different phases.

The first phase lasts until 160 ms after the downlink dedicated channel is considered established by higher layers (physical channel establishment is defined in [5]). During this time out-of-sync shall not be reported and in-sync shall be reported using the CPHY-Sync-IND primitive if the following criterion is fulfilled:

- The UE estimates the DPCCH quality over the previous 40 ms period to be better than a threshold Q_{in}. This criterion shall be assumed not to be fulfilled before 40 ms of DPCCH quality measurements have been collected. Q_{in} is defined implicitly by the relevant tests in [7].

The second phase starts 160 ms after the downlink dedicated channel is considered established by higher layers. During this phase both out-of-sync and in-sync are reported as follows.

Out-of-sync shall be reported using the CPHY-Out-of-Sync-IND primitive if either of the following criteria are fulfilled:

- The UE estimates the DPCCH quality over the previous 160 ms period to be worse than a threshold Q_{out}. Q_{out} is defined implicitly by the relevant tests in [7].

- The 20 most recently received transport blocks with a CRC attached, as observed on all TrCHs using CRC, have been received with incorrect CRC. In addition, over the previous 160 ms, all transport blocks with a CRC attached have been received with incorrect CRC.

In-sync shall be reported using the CPHY-Sync-IND primitive if both of the following criteria are fulfilled:

- The UE estimates the DPCCH quality over the previous 160 ms period to be better than a threshold Q_{in}. Q_{in} is defined implicitly by the relevant tests in [7].

- At least one transport block with a CRC attached, as observed on all TrCHs using CRC, is received in a TTI ending in the current frame with correct CRC. If no transport blocks are received, or no transport block has a CRC attached, this criterion shall be assumed to be fulfilled.

How the primitives are used by higher layers is described in [5]. The above definitions may lead to radio frames where neither the in-sync nor the out-of-sync primitives are reported.

4.3.1.3 Uplink synchronisation primitives

Layer 1 in the Node B shall every radio frame check synchronisation status of all radio link sets. Synchronisation status is indicated to the RL Failure/Restored triggering function using either the CPHY-Sync-IND or CPHY-Out-of-Sync-IND primitive. Hence, only one synchronisation status indication shall be given per radio link set.

The exact criteria for indicating in-sync/out-of-sync is not subject to specification, but could e.g. be based on received DPCCH quality or CRC checks. One example would be to have the same criteria as for the downlink synchronisation status primitives.

4.3.2 Radio link establishment and physical layer reconfiguration for dedicated channels

4.3.2.1 General

~~The establishment of a radio link can be divided into two cases:~~ Two synchronisation procedures are defined in order to obtain physical layer synchronisation of dedicated channels between UE and UTRAN:

- Synchronisation procedure A: This procedure shall be used ~~when there is no existing radio link, i.e.~~ when at least one downlink dedicated physical channel and one uplink dedicated physical channel are to be set up~~;~~ on a frequency and none of the radio links after the establishment/reconfiguration existed prior to the establishment/reconfiguration which also includes the following cases :

    - The UE was previously on another RAT i.e. inter-RAT handover

    - the UE was previously on another frequency i.e. inter-frequency hard handover

    - the UE has all its previous radio links removed and replaced by other radio links i.e. intra-frequency hard-handover

- Synchronisation procedure B : it shall be used ~~or~~ when one or several radio links ~~already exist~~ are added to the active set and at least one of the radio links prior to the establishment/reconfiguration still exists after the establishment/reconfiguration, ~~i.e. when at least one downlink dedicated physical channel is to be set up and an uplink dedicated physical channel already exists~~.

For all other physical layer reconfigurations not listed above, the UE and UTRAN shall not perform any of the synchronisation procedures listed above.

The two ~~cases~~ synchronisation procedures are described in subclauses 4.3.2.~~2~~3 and 4.3.2.~~3~~4 respectively.

4.3.2.2 Node B radio link set state machine

In Node B, each radio link set can be in three different states: initial state, out-of-sync state and in-sync state. Transitions between the different states is shown in figure 1 below. The state of the Node B at the start of radio link establishment is described in the following subclauses. Transitions between initial state and in-sync state are described in subclauses 4.3.2.2 and 4.3.2.3 and transitions between the in-sync and out-of-sync states are described in subclause 4.3.3.2.
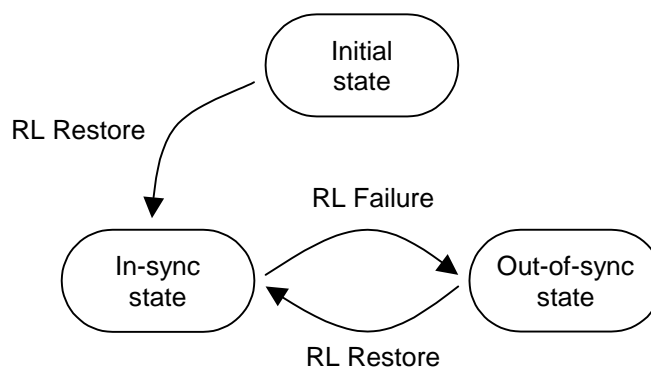

Figure 1: Node B radio link set states and transitions

4.3.2.~~2~~3 ~~No existing radio~~ Synchronisation procedure A~~link~~

~~When one or several radio links are to be established and there is no existing radio link for the UE already, a dedicated physical channel is to be set up in uplink and at least one dedicated physical channel is to be set up in downlink. This corresponds to the case when a dedicated physical channel is initially set up on a frequency.~~

The synchronisation establishment procedure, which begins at the time indicated by higher layers (either immediately at receipt of upper layer signalling, or at an indicated activation time), radio link establishment is as follows:

   a)   a) Each NNode B involved in the procedure considerssets the all itsthe radio link sets which are to be set-up for this UE which are to be set up to be in the initial state.

   b)   -UTRAN shall start the transmission of the downlink DPCCH. and may start the transmission of DPDCH if any data is to be transmitted. The initial downlink DPCCH transmit power is set by higher layers [6]. Downlink TPC commands are generated as described in 5.1.2.2.1.2.

   c)   The UE establishes downlink chip and frame synchronisation of DPCCH, using the P-CCPCH timing and timing offset information notified from UTRAN. Frame synchronisation can be confirmed using the frame synchronisation word. Downlink synchronisation status is reported to higher layers every radio frame according to sub-clause 4.3.1.2.

   d)c)   The UE shall not transmit on uplink until higher layers consider the downlink physical channel established. If no activation time for uplink DPCCH has been signalled to the UE, uplink DPCCH transmission shall start when higher layers consider the downlink physical channel established. If an activation time has been given, uplink DPCCH transmission shall not start before the downlink physical channel has been established and the activation time has been reached. Physical channel establishment and activation time are defined in [5]. The initial uplink DPCCH transmit power is set by higher layers [5]. In case of physical layer reconfiguration the uplink DPCCH power is kept unchanged between before and after the reconfiguration except for inner loop power control adjustments.. The total signalling response delay for the establishment of a new DPCH shall not exceed the requirements given in [8] sub-clause 7.3. A power control preamble shall be applied as indicated by higher layers. The uplink DPDCH transmission shall not start before the end of the power control preamble. The length of the power control preamble is N_{pcp} radio frames beginning at the start of uplink DPCCH transmission, where N_{pcp} is a higher layer parameter set by UTRAN [5]. Note that the transmission start delay between DPCCH and DPDCH may be cancelled using a power control preamble of 0 length. The starting time for transmission of DPDCHs shall also satisfy the constraints on adding transport channels to a CCTrCH, as defined in [2] sub-clause 4.2.14.

   e)   d) UTRAN establishes uplink chip and frame synchronisation. Frame synchronisation can be confirmed using the frame synchronisation word. Radio link sets remain in the initial state until N_INSYNC_IND successive in-sync indications are received from layer 1, when Node B shall trigger the RL Restore procedure indicating which radio link set has obtained synchronisation. When RL Restore has been triggered the radio link set shall be considered to be in the in-sync state. The parameter value of N_INSYNC_IND is configurable, see [6]. The RL Restore procedure may be triggered several times, indicating when synchronisation is obtained for different radio link sets.

Note: The total signalling response delay for the establishment of a new DPCH shall not exceed the requirements given in [8] sub-clause 7.3.

4.3.2.34   Synchronisation procedure BOne or several existing radio links

When one or several radio links are to be established and one or several radio links already exist, there is an existing DPCCH/DPDCH in the uplink, and at least one corresponding dedicated physical channel shall be set up in the downlink. This corresponds to the case when new radio links are added to the active set and downlink transmission starts for those radio links.

The synchronisation procedure B, which begins at the time indicated by higher layers (either immediately at receipt of upper layer signalling, or at an indicated activation time)radio link establishment is as follows:

   a)   a) The following applies to aeach Node B involved in the procedure:

      -   Node B considers nNew radio link sets to beare set up to be in initial state.

      -   -If a one or several radio links is to beare added to an existing radio link set, this radio link set shall be considered to be in the state the radio link set was prior to the addition of the radio link, i.e. if the radio link set was in the in-sync state before the addition of the radio link it shall remain in that state.

b) UTRAN starts the transmission of the downlink DPCCH/DPDCH <u>for each new radio link</u> at a frame timing such that the frame timing received at the UE will be within $T_0 \pm 148$ chips prior to the frame timing of the uplink DPCCH/DPDCH at the UE. Simultaneously, UTRAN establishes uplink chip and frame synchronisation of ~~the~~ <u>each</u> new radio link. Frame synchronisation can be confirmed using the frame synchronization word. Radio link sets considered to be in the initial state shall remain in the initial state until N_INSYNC_IND successive in-sync indications are received from layer 1, when Node B shall trigger the RL Restore procedure indicating which radio link set has obtained synchronisation. When RL Restore is triggered the radio link set shall be considered to be in the in-sync state. The parameter value of N_INSYNC_IND is configurable, see [6]. The RL Restore procedure may be triggered several times, indicating when synchronisation is obtained for different radio link sets.

c) The UE establishes chip and frame synchronisation of ~~the~~ <u>each</u> new radio link. <u>Layer 1 in the UE keeps reporting downlink synchronisation status to higher layers every radio frame according to the second phase of sub-clause 4.3.1.2.</u> Frame synchronisation can be confirmed using the frame synchronization word. ~~Downlink synchronisation status shall be reported to higher layers every radio frame according to subclause 4.3.1.2.~~

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CHANGE REQUEST

⌘ **25.214 CR 181** ⌘ ʳev **3** ⌘ Current version: **4.0.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title: ⌘	Clarification of synchronisation procedures	
Source: ⌘	Nortel Networks, Ericsson, Panasonic	
Work item code: ⌘		***Date:*** ⌘ 06-08-2001

Category: ⌘ **A**	***Release:*** ⌘ REL-4

Use one of the following categories:
F *(correction)*
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R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change: ⌘	Synchronisation procedures as described in section 4.3 25.214 currently considers only the establishment and radio link addition cases and nothing is specified for the reconfiguration cases. The CR clarifies in which case the existing procedures can be used and how the UE and UTRAN should behave in terms of synchronisation.
Summary of change: ⌘	The synchronisation procedures "no existing radio link" (section 4.3.2.2) and "one or several existing radio links" (section 4.3.2.3) are renamed synchronisation procedures A and synchronisation procedure B. -Synchronisation procedure A applies when at least one downlink dedicated physical channel and one uplink dedicated physical channel are to be set up on a frequency and none of the radio links after the establishment/reconfiguration existed prior to the establishment/reconfiguration. This corresponds to inter-RAT, inter-frequency handover and intra-frequency hard-handover It should be noted that a intra-frequency intra-cell handover is not considered as a hard handover as the radio link(s) are maintained. -Synchronisation method B applies in the case one or several radio links are added and at least one radio link from before the reconfiguration is maintained; This is to clarify that an active set update message will effectively lead to procedure B is one link is maintained, so this is not a hard handover. Merge with CR25.214-174 (R1-01-0498) for the changes contained in section 4.3.2.3.
Consequences if not approved: ⌘	Unclear specifications, ambiguous UE and UTRAN behaviour as far as synchronisation is concerned when physical channel reconfigurations occur, in particular for handover cases (inter-frequency, intra-frequency hard handover)

		compared to other cases of physical channel reconfiguration. As which synchronisation procedure is to be applied by UE and UTRAN are not clear there is significant risk that they apply different procedures.

Clauses affected:	⌘	4.3.2 and subclauses		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

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4.3 DPCCH/DPDCH synchronisation

4.3.1 Synchronisation primitives

4.3.1.1 General

For the dedicated channels, synchronisation primitives are used to indicate the synchronisation status of radio links, both in uplink and downlink. The definition of the primitives is given in the following subclauses.

4.3.1.2 Downlink synchronisation primitives

Layer 1 in the UE shall every radio frame check synchronisation status of the downlink dedicated channels. Synchronisation status is indicated to higher layers using the CPHY-Sync-IND and CPHY-Out-of-Sync-IND primitives.

The criteria for reporting synchronisation status are defined in two different phases.

The first phase lasts until 160 ms after the downlink dedicated channel is considered established by higher layers (physical channel establishment is defined in [5]). During this time out-of-sync shall not be reported and in-sync shall be reported using the CPHY-Sync-IND primitive if the following criterion is fulfilled:

- The UE estimates the DPCCH quality over the previous 40 ms period to be better than a threshold Q_{in}. This criterion shall be assumed not to be fulfilled before 40 ms of DPCCH quality measurements have been collected. Q_{in} is defined implicitly by the relevant tests in [7].

The second phase starts 160 ms after the downlink dedicated channel is considered established by higher layers. During this phase both out-of-sync and in-sync are reported as follows.

Out-of-sync shall be reported using the CPHY-Out-of-Sync-IND primitive if either of the following criteria are fulfilled:

- The UE estimates the DPCCH quality over the previous 160 ms period to be worse than a threshold Q_{out}. Q_{out} is defined implicitly by the relevant tests in [7].

- The 20 most recently received transport blocks with a CRC attached, as observed on all TrCHs using CRC, have been received with incorrect CRC. In addition, over the previous 160 ms, all transport blocks with a CRC attached have been received with incorrect CRC.

In-sync shall be reported using the CPHY-Sync-IND primitive if both of the following criteria are fulfilled:

- The UE estimates the DPCCH quality over the previous 160 ms period to be better than a threshold Q_{in}. Q_{in} is defined implicitly by the relevant tests in [7].

- At least one transport block with a CRC attached, as observed on all TrCHs using CRC, is received in a TTI ending in the current frame with correct CRC. If no transport blocks are received, or no transport block has a CRC attached, this criterion shall be assumed to be fulfilled.

How the primitives are used by higher layers is described in [5]. The above definitions may lead to radio frames where neither the in-sync nor the out-of-sync primitives are reported.

4.3.1.3 Uplink synchronisation primitives

Layer 1 in the Node B shall every radio frame check synchronisation status of all radio link sets. Synchronisation status is indicated to the RL Failure/Restored triggering function using either the CPHY-Sync-IND or CPHY-Out-of-Sync-IND primitive. Hence, only one synchronisation status indication shall be given per radio link set.

The exact criteria for indicating in-sync/out-of-sync is not subject to specification, but could e.g. be based on received DPCCH quality or CRC checks. One example would be to have the same criteria as for the downlink synchronisation status primitives.

4.3.2 Radio link establishment and physical layer reconfiguration for dedicated channels

4.3.2.1 General

~~The establishment of a radio link can be divided into two cases:~~ Two synchronisation procedures are defined in order to obtain physical layer synchronisation of dedicated channels between UE and UTRAN:

- Synchronisation procedure A: This procedure shall be used ~~when there is no existing radio link, i.e.~~ when at least one downlink dedicated physical channel and one uplink dedicated physical channel are to be set up~~;~~ on a frequency and none of the radio links after the establishment/reconfiguration existed prior to the establishment/reconfiguration which also includes the following cases :

    - The UE was previously on another RAT i.e. inter-RAT handover

    - the UE was previously on another frequency i.e. inter-frequency hard handover

    - the UE has all its previous radio links removed and replaced by other radio links i.e. intra-frequency hard-handover

- Synchronisation procedure B : it shall be used ~~or~~ when one or several radio links ~~already exist~~ are added to the active set and at least one of the radio links prior to the establishment/reconfiguration still exists after the establishment/reconfiguration, ~~i.e. when at least one downlink dedicated physical channel is to be set up and an uplink dedicated physical channel already exists~~.

For all other physical layer reconfigurations not listed above, the UE and UTRAN shall not perform any of the synchronisation procedures listed above.

The two ~~cases~~ synchronisation procedures are described in subclauses 4.3.2.~~2~~3 and 4.3.2.~~3~~4 respectively.

4.3.2.2 Node B radio link set state machine

In Node B, each radio link set can be in three different states: initial state, out-of-sync state and in-sync state. Transitions between the different states is shown in figure 1 below. The state of the Node B at the start of radio link establishment is described in the following subclauses. Transitions between initial state and in-sync state are described in subclauses 4.3.2.2 and 4.3.2.3 and transitions between the in-sync and out-of-sync states are described in subclause 4.3.3.2.
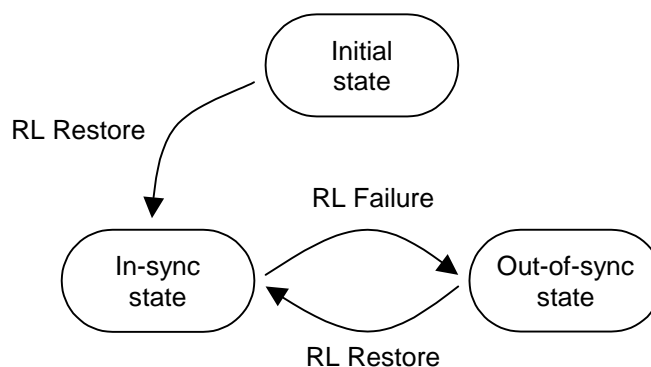

Figure 1: Node B radio link set states and transitions

4.3.2.~~2~~3 ~~No existing radio~~ Synchronisation procedure A~~link~~

~~When one or several radio links are to be established and there is no existing radio link for the UE already, a dedicated physical channel is to be set up in uplink and at least one dedicated physical channel is to be set up in downlink. This corresponds to the case when a dedicated physical channel is initially set up on a frequency.~~

The synchronisation establishment procedure, which begins at the time indicated by higher layers (either immediately at receipt of upper layer signalling, or at an indicated activation time), radio link establishment is as follows:

a) a) Each N Node B involved in the procedure considers sets the all its the radio link sets which are to be set-up for this UE which are to be set up to be in the initial state.

b) -UTRAN shall start the transmission of the downlink DPCCH. and may start the transmission of DPDCH if any data is to be transmitted. The initial downlink DPCCH transmit power is set by higher layers [6]. Downlink TPC commands are generated as described in 5.1.2.2.1.2.

c) The UE establishes downlink chip and frame synchronisation of DPCCH, using the P-CCPCH timing and timing offset information notified from UTRAN. Frame synchronisation can be confirmed using the frame synchronisation word. Downlink synchronisation status is reported to higher layers every radio frame according to sub-clause 4.3.1.2.

d)c) The UE shall not transmit on uplink until higher layers consider the downlink physical channel established. If no activation time for uplink DPCCH has been signalled to the UE, uplink DPCCH transmission shall start when higher layers consider the downlink physical channel established. If an activation time has been given, uplink DPCCH transmission shall not start before the downlink physical channel has been established and the activation time has been reached. Physical channel establishment and activation time are defined in [5]. The initial uplink DPCCH transmit power is set by higher layers [5]. In case of physical layer reconfiguration the uplink DPCCH power is kept unchanged between before and after the reconfiguration except for inner loop power control adjustments. The total signalling response delay for the establishment of a new DPCH shall not exceed the requirements given in [8] sub-clause 7.3. A power control preamble shall be applied as indicated by higher layers. The uplink DPDCH transmission shall not start before the end of the power control preamble. The length of the power control preamble is N_{pcp} radio frames beginning at the start of uplink DPCCH transmission, where N_{pcp} is a higher layer parameter set by UTRAN [5]. Note that the transmission start delay between DPCCH and DPDCH may be cancelled using a power control preamble of 0 length. The starting time for transmission of DPDCHs shall also satisfy the constraints on adding transport channels to a CCTrCH, as defined in [2] sub-clause 4.2.14.

e) d) UTRAN establishes uplink chip and frame synchronisation. Frame synchronisation can be confirmed using the frame synchronisation word. Radio link sets remain in the initial state until N_INSYNC_IND successive in-sync indications are received from layer 1, when Node B shall trigger the RL Restore procedure indicating which radio link set has obtained synchronisation. When RL Restore has been triggered the radio link set shall be considered to be in the in-sync state. The parameter value of N_INSYNC_IND is configurable, see [6]. The RL Restore procedure may be triggered several times, indicating when synchronisation is obtained for different radio link sets.

Note: The total signalling response delay for the establishment of a new DPCH shall not exceed the requirements given in [8] sub-clause 7.3.

4.3.2.34   Synchronisation procedure BOne or several existing radio links

When one or several radio links are to be established and one or several radio links already exist, there is an existing DPCCH/DPDCH in the uplink, and at least one corresponding dedicated physical channel shall be set up in the downlink. This corresponds to the case when new radio links are added to the active set and downlink transmission starts for those radio links.

The synchronisation procedure B, which begins at the time indicated by higher layers (either immediately at receipt of upper layer signalling, or at an indicated activation time) radio link establishment is as follows:

a) a) The following applies to a each Node B involved in the procedure:

- Node B considers n New radio link sets to be are set up to be in initial state.

- -If a one or several radio links is to be are added to an existing radio link set, this radio link set shall be considered to be in the state the radio link set was prior to the addition of the radio link, i.e. if the radio link set was in the in-sync state before the addition of the radio link it shall remain in that state.

b) UTRAN starts the transmission of the downlink DPCCH/DPDCH <u>for each new radio link</u> at a frame timing such that the frame timing received at the UE will be within $T_0 \pm 148$ chips prior to the frame timing of the uplink DPCCH/DPDCH at the UE. Simultaneously, UTRAN establishes uplink chip and frame synchronisation of ~~the~~ <u>each</u> new radio link. Frame synchronisation can be confirmed using the frame synchronization word. Radio link sets considered to be in the initial state shall remain in the initial state until N_INSYNC_IND successive in-sync indications are received from layer 1, when Node B shall trigger the RL Restore procedure indicating which radio link set has obtained synchronisation. When RL Restore is triggered the radio link set shall be considered to be in the in-sync state. The parameter value of N_INSYNC_IND is configurable, see [6]. The RL Restore procedure may be triggered several times, indicating when synchronisation is obtained for different radio link sets.

c) The UE establishes chip and frame synchronisation of ~~the~~ <u>each</u> new radio link. <u>Layer 1 in the UE keeps reporting downlink synchronisation status to higher layers every radio frame according to the second phase of sub-clause 4.3.1.2.</u> Frame synchronisation can be confirmed using the frame synchronization word. ~~Downlink synchronisation status shall be reported to higher layers every radio frame according to subclause 4.3.1.2.~~