

Agenda Item: -

Source: RAN WG1 Chairman and secretary

Title: Draft minutes of RAN WG1 HSDPA Ad Hoc, including joint sessions with TSG RAN WG2

Document for: Approval

Draft Minutes for 3GPP TSG-RAN WG1 HSDPA Ad Hoc

Meeting start: November 5th 2001 in ETSI, Sophia Antipolis, France

Day 1, started at 09.10

Joint session with TSG RAN WG2

1. Opening of the meeting

(09:10 - 09:12)

TSG RAN WG2 chairman Mr. Denis Fauconnier (Nortel) and TSG RAN WG1 chairman Mr. Antti Toskala (Nokia) opened the meeting.

2. Approval of agenda

(09:12 - 09:23)

12A010046 *Proposed agenda*

Chairman (Mr. Denis Fauconnier) made a brief introduction of the agenda on the screen.

Agenda was approved with no specific comments. There were some adjustments made on the document allocations onto agenda items. RAN WG1 chairman proposed to present **RP-010678** in section 4.1, which had been presented in RAN #13 in Beijing.

3. Status of HSDPA in RAN WG2

3.1 Latest version of TS 25.308 after RAN WG2 #24 (12A010049)

(09:24 - 09:43)

Mr. Kuchibhotla Ravi (Motorola) presented this paper.

This is the document which has replaced TR on HSDPA and now is being referred by ITU for HSDPA. RAN WG2 updated this documents in the New York meeting. (TSG RAN WG2 #24)

Section 9.2 *Mobility Procedures* is going to be reviewed by RAN WG2 prior to the submission to RAN #14.

All the annexes (informative) are going to be removed in December RAN meeting.

The important point to be noted for this joint session is table 1 *Downlink Signalling Parameters*. There are a couple of FFS and blank spaces left for the joint discussion. The intention is to submit one CR to RAN #14 capturing all the progresses in RAN WG1, RAN WG2 and RAN WG3. RAN WG1 is invited to provide inputs on FFS parts to RAN WG2 before its #25 meeting in Japan. Then RAN WG2 will create one single CR for RAN #14.

RAN WG1 chairman questioned whether we should put the information of the exact bit length in the specs. RAN WG2 chairman answered that this information is very important between the 2 WGs although at the end they may not be written like this in the final specification.

3.2 RAN WG2 identified physical layer requirements

RAN WG2 chairman stated that the table 1 in TS 25.308 (12A010049) is the identified physical layer requirements.

4. Status of HSDPA in RAN WG1

4.1 Current status of physical layer work

(09:43-10:14)

RP-01-0678 HSDPA - Physical Layer Status Report

RAN WG1 chairman presented this PPT document on the screen. This was the document that had been presented in RAN #13.

Some discussion was made on following 2 points.

1. What is the meaning of following sentence in terms of scheduling ?

"The terminal memory requirement shall be derived based on Chase (soft) combining i.e. at max data rate (as given by UE capabilities) only Chase combining can be used."

→ When we consider the UE classes with respect to the bit rate we need to consider the buffering capability because there is a connection between bit rates and combining methods (Chase or IR). For a certain bit rate class, there will be a certain buffering capability. If we would transmit with the maximum bit rate then we will not be able to use IR because IR requires much more memory than Chase and so we have to use Chase combining for the maximum bit rate transmission.

There seemed to be different level of what RAN WG1 and RAN WG2 want to specify with respect to the memory handling. In RAN WG2 there is a relatively simple assumption on UE memory handling that is described in TS 25.308. There is a given memory in the UE which is for all processes and if UE runs out the memory because the scheduler sent the data then the oldest stored transport block is to be simply removed from the memory. It is totally up to the scheduler how to do with memory based on the UE capability. But RAN WG1 considers that network should have the means to be able to explicitly understand and determine how much data it can send to the UE rather than just sending something that might be ignored by the UE depending on the implementation.

→ In any case we need to consider at least the error cases and how this (RAN WG1 suggesting) method would complicate the system

2. If the maximum bit rate can only be achieved by using Chase combining then where is the benefit to use IR with much more complexity and signalling requirements at lower data rate from the technical point of view ?

→ There were certain results presented in RAN WG1 that indicated gains in certain cases with IR. The main drawback of IR is memory consumption. RAN WG1 will continue the challenge to get agreement from the several different proposals which are now on the table for IR.

It was confirmed that IR is mandatory for HSDPA capable UE.

4.2 Questions from RAN WG1 to RAN WG2

No inputs to this agenda item.

5. Joint activities

No.	Category	T-doc	Title	Source	Conclusion	Notes
1		12A010076	Number of simultaneous active HSDPA users & impact on resource	Qualcomm	Noted	(*1) Day 1 10:15-10:53

(*1) Mr. Serge Willenegger (Qualcomm) presented this paper.

There has been a concern raised by Qualcomm that the usable HSDPA code space may be reduced significantly due to the resource utilization associated with HSDPA control channels taking into account that the system may have to support up to 200 simultaneous HSDPA users with certain traffic modes.

Based on this concern this paper suggested an additional control structure which minimizes the code utilization.

A long discussion took place. Major opinions were

- we should reduce the number of the options in the system.
- even if agree with the concern on potential code limitation issues, it is a question whether we should consider this kind of optimisation for Rel-5 time frame. There is not so much time remaining. We can consider in the later releases.
 - it is not clear that this is an optimisation. It may be critical to HSDPA requirements. (Qualcomm)
- the identified concern depends on the assumption of the traffic model, applications.
- we should have decision now.

Taking into account those opinions and the fact that there was not so much support from the floor, chairman suggested to consider this for later releases after having seen the results from the field. In case we have this addition for later releases, we need to create specific Work Item.

/*** Day1 Coffee break at 10:53-11:30 ***/

5.1 Timing of MAC-hs operation

No.	Category	T-doc	Title	Source	Conclusion	Notes
2		12A010059	Associated downlink signalling	Ericsson	Noted / Questions answered	(*1) Day 1 11:35-12:23
3		12A010069	Timing Relationship to support HSDPA Operation	Motorola	Noted	(*2) Day 1 12:23-12:55
4		12A010074	HI transmission issues and impact on two step approach	Nortel	→ working assumption	(*3) Day 1 14:08-15:54
5		12A010070	Transport format and resource signalling for HSDPA	Motorola	Noted	(*4) Day 1 15:54-16:31
6		12A010062	Uplink acknowledgement timing for HSDPA	Panasonic	Noted	(*5) Day 1 17:42-18:16
7		12A010067	Transmission timing for Uplink signalling	Sony	Noted → R1	(*6) Day 1 18:16-18:20
8		12A010068	Efficient method for TFRI signalling	Samsung	Noted → R1	Not reviewed. Covered by the previous discussions
9		12A010057	TFRI and HARQ Signalling for HSDPA	Lucent	Noted	
10		12A010050	3.84 Mcps TDD HSDPA signalling aspects	IPWireless	Noted	(*7) Day 1 18:23-18:39
11		12A010053	Signalling Channel Structures for TDD HSDPA	Siemens	Noted → R1	For info. Not reviewed
12		12A010055	Signalling support for multiple simultaneous transmissions to a UE within a TTI	Lucent	Noted	(*8) Day 1 18:42-19:16
13		12A010075	Efficient use of IR version	Qualcomm	Noted	(*9) Day 1 19:16-19:38
14		12A010047	Channel Quality Measurement Report	Philips	Noted → R1	For info. Not reviewed
15		12A010065	Resequencing Buffer Performance	Lucent	Noted	(*10) Day 1 19:40-20:02

(*1) Mr. Erik Dahlman (Ericsson) presented this paper.

This paper discussed the downlink signalling associated with HS-DSCH transmission. Based on the discussion, a following proposal for the associated downlink signalling had been derived.

- Partly overlapping Shared-Control-Channel information and HS-DSCH TTI
- TFRI (*Transport Format and Resource Information*) split into two separately encoded/transmitted parts to allow for early decoding of time-critical information
- CRC calculated over entire set of Shared-Control-Channel information but transmitted in the second part of the Shared Control Channel.

In addition, following questions had been identified in this paper for the joint session discussion with RAN WG1 and RAN WG2.

- What is the required granularity in the dynamic channelization-code allocation? Should full granularity be supported or is some limitation in the granularity acceptable?
- What is the required granularity in the dynamic variations in the transport-block-set size?
- Should the transport-channel identity be conveyed by means of out-band signalling on the Shared Control Channel? What is the maximum number of multiplexed HS-DSCH?
- What is the length (in bits) of the UE identity to be transmitted on the Shared Control Channel?

A number of questions for clarification were made. They were all answered by the proponent.

RAN WG2 chairman made a question on timing of associated DL DPCH and HS-DSCH indicator (section 3.2). What is the rationale behind this timing relation? It seems rather complicated. RAN WG2 wanted to know the basic assumptions and exact gain.

Ms. Evelyne Le Strat (Nortel) remarked that the assumption here is different from what has been discussed in RAN WG1 in terms of grouping and mapping of the pieces of information (transport block size, transport block set size, transport channel identifier and information related HARQ) and therefore this should be revisited in RAN WG1.

Since there was another paper from Motorola discussing this timing issue, chairman suggested to review it in succession.

Answers for the questions made in Ericsson's paper were discussed after having reviewed all the timing related papers in the afternoon. (See No. 5)

(*2) Mr. Kenneth Stewart (Motorola) presented this paper.

This paper discussed the timing relationship for HSDPA uplink and discusses the timing constraint necessary at the UE receiver and the Node-B transmitter for proper operation of the HSDPA system.

It was stated by the proponent that there is not so much difference from Ericsson's proposal in terms of timing relation. The main difference is the preference of timing overlap between HS-SCCH and HS-PDSCH. Ericsson prefers 2 slot overlapping and Motorola prefers 1 slot overlapping.

Ms. Evelyne Le Strat (Nortel) pointed out that there is a difference between 2 proposals in terms of grouping of the information. She said that this particular proposal seemed to be in line with the RAN WG1 understanding. RAN WG2 chairman stated that what is important for RAN WG2 is to understand round-trip time for the HARQ processes (the decision of the transmission in Node B to the Ack), scheduling delay, the number of bits and protection of the information rather than having fine details of mapping or split of the information.

/*** Day1 Lunch break. 12:56-14:07 ***/

Day1 Afternoon session. Chairman announced that we would have quick review on papers on timing related issues. The intention was to capture the list of the items that should be addressed in the joint session. The mapping or more RAN WG1 related discussions would just be presented for information to RAN WG2 people.

(*3) Ms. Evelyne Le Strat (Nortel) presented this paper.

This paper firstly discussed the current status regarding the HI content and transmission, in both RAN WG1 and RAN WG2 documentation and identified differences. Secondly this paper clarified the requirements for the transmission of the HI and evaluated the different transmission schemes proposed in contributions submitted to RAN WG1 HSDPA ad-hoc towards these requirements. It was stated that we need to revisit globally the need for HI. She said that we need to check what the real gain that it brings as a function of relative timing between HI and HS-DSCH is. For the time being there is no scheme agreed for which we can be sure there is sufficiently good robustness. She concluded that it is difficult to agree that HI is effectively needed.

A long discussion took place on the robustness of signalling parameters, which was in principle different topic from this particular paper on HI.

RAN WG2 needed some target values of robustness because how well the protocol works depends on the reliability of the parameters. Following table was used to aid the discussion on reliability issues.

Downlink signalling parameters (from TS 25.308)

Parameter	Channel Location	Length in bits	False detection/decoding	Target error rate
HARQ Parameters				
Process Identity	HS-SCCH	3		
New Data Indicator	HS-SCCH	1 (2 bits FFS)		
Priority Class Indicator	HS-DSCH	3		
TSN	HS-DSCH	6		
Padding Block Indicator or TB count (FFS)	HS-DSCH	FFS		
C-RNTI (FFS)	HS-DSCH	16		
Transport Format and Resource Indication Parameters				
HS-DSCH Id	HS-SCCH			
TFormat	HS-SCCH			
Redundancy version	HS-SCCH			
Resource Mapping	HS-SCCH			
Other				
Short UE Id	HS-SCCH		strong	

The assumption in RAN WG1 TR is that there is one CRC to cover whole signalling because it would not make much sense to decode correctly just part of the information on the shared control channel. By having one CRC to cover whole signalling we can get uniform probability of undetected error for all signalling RAN WG2 listed here.

Eventually it was agreed to focus on the probability for different steps rather than reliability for individual parameters part of each steps in the ARQ operation. Discussion was then focused on the level of reliability.

What does RAN WG2 expect and what can RAN WG1 provide. After some discussion, following assumptions were agreed by both WGs. RAN WG2 chairman stated that RAN WG2 would try to make protocol with this assumption and RAN WG1 would try to fulfil this assumption.

Assumptions defined for quality targets :

- Target for HI + HS-SCCH transmission 99% or better of correct reception
- L1 provides erroneous HS-SCCH info to MAC-hs 10⁻⁴ to 10⁻⁵ (RAN2 preference) ? or better (12 bits CRC... Note that later WG1 agreed to use 16 bit CR to ensure sufficient reliability)
- MAC-hs delivery to upper layers : protected by C-RNTI with 24 bits CRC ? or UE specific CRC... This to be elaborated by WG1, probability should be very small.

RAN WG1 chairman stated that with respect to in-band ID, RAN WG1 would inform RAN WG2 of the signalling solution in RAN WG1 with CRCs on different channels after RAN WG1#22 meeting. After that RAN WG2 will be able to decide whether in-band ID would add some benefit or not. RAN WG2 chairman agreed.

Later during day 2 the ACK/NACK reliability was discussed separately.

With respect the need for HI, whether we should have HI or not (original topic of this particular paper), RAN WG2 chairman suggested that it should be discussed and solved in RAN WG1 internally.

(*4) Motorola presented this paper.

This paper discussed issues related to signalling of transport format and resource allocation information. 7 parameters were identified as describing the TFRI parameters including the code assignment, modulation level, transport channel identifier and transport block set size. 3 options were considered for mapping the TFRI parameters on to the 10-bit field. It was recommended that the 10-bit dynamic-split TFRI (option2) be adopted for the HS-DSCH. (More bits are to be needed in case 64QAM is included in the modulation scheme.) It was also recommended that the HS-DSCH MAC header provide a method for transport block padding.

Option 1 : 12 bits solution

Option 3 : 10 bits solution that requires 1024 table entry in the UE

Option 2 : alternative 10 bits solution with reduced table entry (224) in the UE

Several questions for clarifications were made.

14 codes had been assumed in this proposal. Siemens proposed 15 codes to be allocated.

RAN WG2 chairman suggested starting the session for answering the questions raised by Ericsson in **12A010059**. (See No. 2)

After a long discussion following answers were agreed by both WGs. (A couple of new items were added to the original Ericsson's questions.) (Day1 16:31-17:12)

Q1. What is the required granularity in the dynamic channelization-code allocation? Should full granularity be supported or is some limitation in the granularity acceptable?

A1. 7bits with 15 codes. This was eventually concluded to be sufficient based on the contributions covered and discussions.

Q2. What is the required granularity in the dynamic variations in the transport-block-set size? What is the maximum number of multiplexed HS-DSCH?

A2. 6 bits for the combination. 1 to at least 4 for the TchId. Leads to a format when taking into account the code allocation (TBD after details have been studied)

Modulation :

1 or 2 bits based on the decisions. Note that later RAN WG1 concluded to have only QPSK and 16 QAM and thus 1 bit was noted to be sufficient.

Q3. Should the transport-channel identity be conveyed by means of out-band signalling on the Shared Control Channel?

A3. This was agreed to be necessary.

Q4. What is the length (in bits) of the UE identity to be transmitted on the Shared Control Channel?

A4. 10bits. Note that RAN WG1 has agreed not actually to transmit the ID but to convey the same information in connection with a 16 bit CRC, please refer to the document in RAN WG1 specific discussions for further details.

Q5. Padding in MAC-hs

A5. Yes. This should be possible and should be also transparent to physical layer.

Q6. UE Id in-band, to protect against error propagation to upper layers ?

A6. Yes (see the discussion in No.4) RAN WG1 will elaborate of the possibility to use UE ID in CRC process to ensure sufficient reliability without UE ID as in-band signalling.

There took place some discussion on the Motorola proposal in 12A010070.

- What is the real advantage in splitting fields as proposed here ?
 - There are some particular allowed combinations that would never be used in practice. The motivation here is to remove such inefficiency so that we can get the maximum number of useful combination out of the information to be signalled.
- If we have explicitly indication of these fields, then we don't need any table maintained at the UE.

Finally RAN WG2 chairman suggested offline discussion. He added that this issue is to be studied in RAN WG1.

RAN WG2 is expecting the conclusion in RAN WG1.

/*** Day1 coffee break 17:12 - 17:42 ***/

(*5) Panasonic presented this paper.

This was a continuation paper from the one submitted in the previous meeting to both WGs. Different options for a flexible uplink signalling had been reviewed and a new concept for the H-ARQ acknowledgement was presented. It was proposed to tie the timing of the H-ARQ acknowledgement to the TFR1. It provides several benefits such as decrease round trip delay and increased throughput while requiring no additional signalling or increased complexity.

Several questions / comments for clarification were made.

- Impact on Node B needs to be clarified.
- System simulations should be conducted to show the gain. We need to see some clear incremental gain in order for us to accept new proposals.
- Regarding shorter round-trip delay to be realized, this would imply that Node B would need to have different kind of timings for different timing UEs. This would not be nice including testing requirement.
- Lucent has another paper (12A010064) related to the same issue with simpler signalling and timing structure on the uplink.
- For higher UE capability class, you should be able to handle higher data rates but with this particular scheme, the higher UE capability class should handle so that T_{UEP} should be minimised. On one hand you are trying to maximise the data rate and on the other hand you are trying to minimise UE processing time.
 - increase of memory requirements.
- Gain is not obvious.

Having these comments, RAN WG2 chairman concluded that this proposal as noted. He added that if some companies want to continue similar proposals, then they should be treated in RAN WG1. 12A010064 (Lucent) is to be reviewed offline.

(*6) Mr. Katsutoshi Itoh (Sony) presented this paper.

This paper proposed a transmission timing for uplink signalling and define more detailed parameters for reporting of quality indicator. Text proposals for TR25.848 and TS25.308 were also provided in the annex.

This was presented for information for this joint session. The details would be revisited in RAN WG1 internal session.

No comments were made.

(*7) Mr. Nicholas Anderson (IPWireless) presented this paper.

This paper outlined points raised in R1-01-1078 which is to be presented in RAN WG1 internal session.

From upper layer point of view, there is no difference between FDD and TDD although there may be difference in the actual ranges of the parameters due to the difference of TTI length. It was stated by the proponent that in TDD quality indication has to be sent up with Ack/Nack signalling.

Proponent will update the documents to include the table that highlights the difference between FDD and TDD.

(*8) Mr. Farooq Khan (Lucent) presented this paper.

This paper showed that simultaneous transmissions to a UE per TTI can be readily accommodated within the proposed HSDPA signalling structure and does provide performance benefits. It is recommended that simultaneous transmissions to a UE within a TTI be allowed for HSDPA.

Some concerns were raised.

- the buffer complexity on both Node B and UE side.
- error handling. (in case UE missed one of the shared control channel of 2 parallel transmission. Confusion would occur at the Node B side receiving different level of Ack/Nack.)
- max C/I scheduler is assumed here. Then what is going to be in case of other scheduler than max C/I ?
- optionality / mandatory issue. Is this going to be mandatory for certain UE classes ?
- The claimed gain of 30% needs to be verified.
- This kind of optimisation should be considered in the later release. We need to concentrate on the basic stuff at this point of time.
- We don't need to rush to Rel-5. We can consider this in the later releases.

There was a supporting comment from Philips saying that this is fairly self-contained idea and it does not have any impact on anything else. This issue should be kept open.

RAN WG2 chairman concluded that this should be considered for the later release. (not in Rel-5) This can be revisited if people are convinced of the benefit.

(*7) Qualcomm presented this paper.

This paper suggested to replace the IR version field in the shared control channel with an indicator of the (re)transmission number.

Several comments were made.

- If UE missed first transmission of shared control channel then UE does not have systematic bits in the

retransmission.

- There seemed to be misunderstanding on the "redundancy version" which has been considered in RAN WG1. "redundancy version" is per transport block set size and number of channelization codes.
- This kind of refinement proposal should be discussed after we have had clear IR scheme.

RAN WG2 chairman concluded that linking protocol with "redundancy version" seems to have some side effects and therefore this kind of proposal should wait until the side effects have been well understood.

(*8) Lucent presented this paper.

In this paper the residual error rate in an N-channel SAW HARQ in the context of a complete system simulation was studied. Results on the residual error rate for various window sizes and N HARQ processes were presented. For both UE speed of 3km/h and 30km/h, with maximum of 6 parallel HARQ processes ($N = 6$), it was shown that a TSN of 5 bits and re-sequencing buffer of 10 blocks would be sufficient for an assumed residual error rate of 10^{-4} . The size of the TSN and the corresponding UE re-sequencing window for the various N with an assumed target residual error rate of 10^{-4} was summarized in the table (table 2). It was proposed that this table be incorporated in TS 25.308 and used as a guide to determine the minimum UE capabilities for the re-sequencing buffer size requirement.

After some discussion this proposal was agreed. It was mentioned that there would be the linkage between the UE class and the needed RRC buffer size.

/*** Day1 closed at 20:07 ***/

Day 2, started at 08.10

RAN WG1 Session

1. Opening of the meeting

The chairman, Mr. Antti Toskala (Nokia), opened the meeting.

2. Approval of agenda

R1-01-1029 *Agenda for TSG RAN WG1 HSDPA Ad Hoc*

Agenda was approved with no comments.

3. Summary of the actions for WG1 from the joint meeting

There was no need to discuss this separately as everybody was in the joint meeting.

4. WG1 TR review

R1-01-0989 *TR 25.858 v 0.0.4 High Speed Downlink Packet Access: Physical Layer Aspects*

Source : Editor

The editor version of the TR was presented by the editor, taking into account the comments from the reflector. The text proposal in **R1-01-1077** was to be included and 8PSK & 64 QAM to be removed, with those changes the version 0.0.4 in R1-01-0989 was approved and became version 0.1.0 which was later provided as **R1-01-1102** on the server. Further text proposals shall be based on version 0.1.0.

5. UE Capability (Agenda item 10)

This was the first topic covered by RAN WG1 in the morning of Day 2 as it was desired to discuss the issues still later with WG2 as well. WG2 joined after lunch.

No.	Category	T-doc	Title	Source	Conclusion	Notes
16		12A010061	Discussion on UE capability of HSDPA	Panasonic	Noted	
17		R1-01-1022	UE capability for HS-DSCH	Nokia	Noted	
18		R1-01-1016	Revised UE Capabilities for HSDPA	Motorola	Noted	
19		R1-01-1046	UE capability parameters for HSDPA	Ericsson	Noted	
20		R1-01-1048	UE capability summary	Ericsson	Noted	

Joint session with TSG RAN WG2 (continuation from Day1)

(Day 2 14:11 –17:49)

UE capabilities

The UE capabilities were first discussed with WG1 and then jointly with WG2. The following summarises the conclusions based on the WG1 and WG1/WG2 discussions:

Summary on UE capabilities related to HSDPA, the following parameters are considered to be the ones used to define the HSDPA UE capabilities

- Maximum number of Transport channel bits per HS-DSCH TTI
- Maximum number of soft channel bits over all HARQ processes
 - The following points were noted to be open if memory allocation was dynamic: possible error cases, how to configure, total number of ARQ processes...but later with WG2 it was agreed to have a semi-static approach.
 - Current assumption after WG1/WG2 session: Number of ARQ processes given to UE by RRC, memory divided evenly to processes (max 8 processes in the signaling currently, regardless number of transport channels
 - WG2 assumption 4 or 8 TrCHs, to be discussed is there a need for UE capability parameter

- for that or not. It was commented that probably with 4 there would be no need.
- In the memory discussions it was noted that more dynamic operation would bring problems with error propagation, Node B scheduler operation, terminal memory management....
- WG2 assumption was reported that memory is semi-static with RRC partitioning, also number of ARQ processes is also semi-static parameter)-after discussed this became common WG1/WG2 assumption
- Modulation scheme (current assumption still that all UEs support QPSK & 16QAM, parameter needed only if 64 QAM is included, note that later WG1 decided not to include 64 QAM)
- Number of channelization codes (or, equivalently, number of channel modulation symbols per TTI)
 - To be discussed is there a link between modulation used and number of codes allowed per TTI
- Minimum inter-TTI interval (to be considered when defining lower capability UE classes)

Action point for WG1 to provide suggestion how to signal HSDPA capabilities listed above. (set of parameters or a "HSDPA class") and suggestion about Rel'99/Rel'4 and HSDPA capability linking...

Action point for WG1 as part of the discussions:

HSDPA and compressed mode link: Should HSDPA reception be required during compressed frame?

Text proposal to be prepared in Jeju for WG1 TR on UE capabilities .

Feed back signalling

Following documents were reviewed.

No.	Category	T-doc	Title	Source	Conclusion	Notes
21		12A010066	Benefits of having explicit feedback report	Sony	Noted	
22		12A010052	UL signalling for TFRC selection	Nokia	Noted	
23		12A010058	Variable rate channel quality feedback in HSDPA	Lucent	Noted	
24		12A010047	Channel Quality Measurement Report	Philips	Noted	
25		12A010078	Feed-back indication for HSDPA	Nortel	Noted	

Need for feedback agreed, detailed scheme still to be agreed. Lessons from outer loop TPC should be taken into account. Concerns raised on performance verification of the schemes. Some form of feedback desired still to be included.

Key issues:

- Solution should be simple for UE and Node B
- UE receiver impact and different performance in different channel conditions should be taken into account (solution should be generic)
- Explicit measurement such as SIR, which is linked for UE implementation can not be used, something related to real receiver efficiency to be reported
- Questions: Need for mapping tables for BLER, frequency of sending the information etc...
→ WG1 to define proposal of UE sending information which TFRC(s) fulfills be BLER target.

ACK/NACK performance requirement

ACK/NACK performance requirement from protocol operation when data has been sent to the UE.

ACK transmitted, Node B erroneous decoding target 10E-2
 NACK transmitted, Node B erroneous decoding target 10E-4
 DTX case inherently included in the above targets....

In case Node B has not transmitted anything, Node B is not listening for ACK/NACK.
 Actual vendor implementation may vary for threshold setting....There was some terminology confusion, but the main issues is that biggest problem occurs if network considers a NACK transmission as an ACK instead, thus that should have highest reliability, as noted above.
 WG1 will use targets in ACK/NACK coding scheme evaluation in the scheme specification process...

The joint session with WG2 was closed at Day2 17:49.

6. HARQ issues.

Following documents were briefly reviewed.

No.	Category	T-doc	Title	Source	Conclusion	Notes
26		R1-01-1081	A New Hybrid-ARQ Scheme Using Incremental Redundancy	Motorola	Noted	
27		R1-01-1015	Performance Comparison of various Incremental Redundancy (IR) Schemes	Motorola	Skipped	Simulation results
28		R1-01-1023	Hybrid ARQ scheme for HSDPA	Nokia	Noted	
29		R1-01-1026	Two stage rate matching for 3GPP HSDPA	Texas Instruments	Noted	
30		R1-01-1027	Variable interleaving pattern approach: Additional results	Texas Instruments	Noted	
31		R1-01-1028	Implementation of Incremental Redundancy by means of Rate Matching	Siemens	Noted	
32		R1-01-1045	Rate Matching for Incremental Redundancy in HSDPA	Ericsson	Noted	
33		R1-01-1042	Selective Packet Retransmission for HARQ	Samsung	Noted	
34		R1-01-1059	Comparison of HARQ Schemes for 16-QAM	Panasonic	Noted	
35		R1-01-1070	A Simple Incremental Redundancy Scheme for HSDPA	OKI	Noted	
36		R1-01-1084	System Performance with IR using fixed TTI and CDM	Motorola	Noted	
37		R1-01-1085	Self-decodable redundancy versions for Two Stage Rate Matching	Texas Instruments	Noted	
38		R1-01-1047	Overview of Proposed Schemes for Incremental Redundancy	Ericsson	Noted	Summary
39		R1-01-1082	Overview of Proposed IR Schemes	Motorola	Noted	Overview
40		R1-01-1092	Channel coding and multiplexing for HS-DSCH channels : Requirements and way forward	Nortel	Noted	Summary
41		R1-01-1041	Harmonization of SMP and the advanced retransmission technologies	Samsung	Noted	(*1)

There was a rapid review round of the HARQ documents submitted. On the IR there were several proposals that were also covered in 3 different summary documents. No major conclusions were reached. Discussions will continue in the next WG1 meeting in Jeju. Chairman reminded that worst case solution would be that we would have only chase combining if IR details are not sorted out soon.

(*1) This paper was reviewed later. It was concluded being too early to conclude on the topic at this point in time due to relationship with other channel coding chain related issues.

7. Modulation & Spreading issues

No.	Category	T-doc	Title	Source	Conclusion	Notes
42		R1-01-1077	Scrambling code for HS-PDSCH	Panasonic	Approved → TR	
43		R1-01-1062	8-PSK Modulation for HSDPA	Lucent	Noted	
44		R1-01-1096	Response to R1-01-1062 from Lucent	Texas Instruments	Noted	
45		R1-01-1098	Traffic-to-Pilot-Ratio Estimation	Qualcomm	Noted	
46		R1-01-1074	System simulation results of 64QAM for HSDPA systems	NTT DoCoMo	Noted	

Conclusions from papers and discussions:

8PSK and 64QAM not to be included in Rel'5.

Text proposal from **R1-01-1077** was agreed (all HS-DSCH channelisation codes under one scrambling codes, as with DSCH as well in Rel'99/4).

8. Channel coding chain with HSDPA

No.	Category	T-doc	Title	Source	Conclusion	Notes
47		R1-01-1025	Channel interleaver modification for HSDPA	Nokia	Noted	

Interleaver modification was not yet agreed, discussions took place on relative complexity of alternative methods. Companies are asked to investigate the issue for the next WG1 meeting, especially 3rd party views were invited.

(R1-01-1076 was withdrawn)

Day 2 closed at 20:07

Day 3, started at 08.08

9. HSDPA timing issues: UE and Node B processing times

9.1 Downlink timing

Following documents were reviewed.

No.	Category	T-doc	Title	Source	Conclusion	Notes
48		R1-01-1093	HI transmission issues and impact on two step approach	Nortel	Noted	
49		R1-01-1049	Associated downlink signalling	Ericsson	Noted	
50		R1-01-1021	HSDPA Timing Relations	Nokia	Noted	
51		R1-01-1013	Timing Relationship to support HSDPA Operation	Motorola	Noted	

Conclusion:

DL timing assumptions agreed and to be used in further detailed proposals:

- 1 slot overlap between HS-SCCH & HS-DSCH (with HS-DSCH codes to receive + modulation indication in the first timeslot)
- HI position on DPCH definition to be worked onwards, whether e.g. TFCI hard split mode is used or whether some symbol(s) is just punctured. HI should be overlapping with the first slot on HS-SCCH (There can be +/- one symbols to either direction depending on the specified HI insertion method on the DPCH slot), thus at least ½ slot available for HI decoding should be feasible. There was later in connection with **R1-01-1044** (Nokia) and **R1-01-1071** (Samsung) agreement that HI should be punctured from the DPCH.
- UE should be able to stay on the same control channel (e.g. whether the control channel can change) with continuous data transmission. If HI points to another control channel during continuous operation UE behaviour to be specified. This to be confirmed together with the number of HS-SCCH UE is required to receive. Issues to be considered: UE complexity aspects, signaling reliability..... This issue was addressed further later in connection with **R1-01-1083** (Motorola) based on which it was concluded that 4 parallel HS-SCCHs would be sufficient from performance point of view and thus the assumption that UE stays on a single HS-SCCH with continuous transmission does not compromise system performance. (Note that UTRAN may still configure more than 4 in total but single UE will consider only max. 4 HS-SCCHs)
- RRC signaling for the power offset of HI symbol assumed. This to be included in a LS to WG2 from next WG1 meeting.

9.2 Uplink timing

No.	Category	T-doc	Title	Source	Conclusion	Notes
52		R1-01-1020	Transmission timing for Uplink signalling	Sony	Noted	

Conclusion:

- Proposal: HS-DPCCH slot boundary to be aligned with DPCCH slot boundary?
- + simplified power control operation (no power ratio change more often than a frame boundary or more frequent gain factor update rate?)
- - ACK/NACK timing variation for the uplink? (from where is the time reduced...)

To be discussed further in the next meeting once Node B/UE implications are studied by different companies. Power offset for ACK/NACK and for feedback to be discussed (RRC or L1?). Chairman noted that earlier assumption about RRC signalling from Turin meeting might not be sensible as it is the individual Node B that will notice it is not getting enough DPCCH power, not the RNC handling RRC signalling.

10. Downlink & Uplink signalling

No.	Category	T-doc	Title	Source	Conclusion	Notes
53		R1-01-1030	Structure of the downlink shared control channel for HSDPA	Siemens	Noted	(*1)
54		R1-01-1043	TFRI definition	Nokia	Noted	
55		R1-01-1083	Power & Channelization Code issues for HSDPA HS-SCH	Motorola	Noted	(*2)
56		R1-01-1087	Pilot Power Ratio Signaling (Corrected)	Motorola	Noted	(*3)
57		R1-01-1065	Review of email discussion on UE-specific CRC	InterDigital	Noted	(*4)
58		R1-01-1066	Updated recommendation for UE-specific CRC	InterDigital	Noted	(*4)
59		R1-01-1044	HI placement in associated DPCH	Nokia	Noted	
60		R1-01-1071	DL Signalling of HS-DSCH Indicator	Samsung	Noted	(*5)

(*1) SF for HS-SCH? 128 or 256 assumed to be revised when bit count finalised..)

(*2) This paper demonstrated that 4 parallel users with CDM would be sufficient, thus 4 codes for HS-SCH would be enough. This indicated that if UE stays with the same HS-SCH as discussed earlier there is no performance loss from network point of view. Thus the possible performance loss concern from an earlier agenda item was clarified and it can be assumed that UE stays with a single code during continuous operation and there is thus no need to revisit the discussion on how many HS-SCH codes a single UE can monitor. Note that UTRAN operation is not restricted, UTRAN may configure more than the number which a single UE is required to receive. This assumes that no e.g. single code UEs are defined to use HS-DSCH.

(*3) Assumption: UE estimates HS-DSCH power level, constant power level over HS-DSCH TTI. (No explicit signalling).

(*4) UE ID is not transmitted, instead 16 bit CRC on the HS-SCH. The method to be defined in detail in the next meeting.

(*5) Current assumption : DPCH puncturing

The following documents listed in the agenda were not covered and were left (of revisions of those) to be discussed in Jeju meeting.

R1-01-1019 (uplink signaling)

R1-01-1024 (uplink signaling for TFRC selection)

R1-01-1040 (Uplink QI signaling)

R1-01-1055 (uplink QI signaling)

R1-01-1072 (Uplink feedback)

The following documents were covered and shall be consider further in the coming meeting.

No.	Category	T-doc	Title	Source	Conclusion	Notes
61		R1-01-1058	Power requirements for uplink ACK/NACK signalling	Philips	Noted	
62		R1-01-1100	Overview of changes required in the specification (HSDPA)	Motorola	Noted	(*1)

(*1) This paper should be considered as checklist for needed specification changes and interested parties were asked to review that for the next meeting to see what is missing.

11. TDD Specific issues

Issues were handled with focus in the text proposal. There were documents that were not presented separately that had been incorporated in the text proposal already.

No.	Category	T-doc	Title	Source	Conclusion	Notes
63		R1-01-1103	Text Proposal for the WG1 Technical Report 25.858	Siemens	Approved	(*1)
64		R1-01-1097	HI transmission on DPCH for 1.28Mcps TDD HSDPA	Samsung	Noted	(*2)
65		R1-01-1088	3.84 Mcps TDD Signalling for HSDPA	IPWireless	e-mail discussion	(*3)

(*1) Text proposal tentatively agreed. TTI issue + feedback issues still to be discussed and possible other concerns on the text proposal to be raised on the reflector during next week.

(*2) To be discussed further in the next meeting, reliability issues to be considered

(*3) Discussion/drafting to continue at the next meeting

R1-01-1099 *Quality Feedback Indication on TDD for HSDPA (InterDigital)* :
to be discussed offline

12. Approval of revised TRs

The revised TR was made available on the server, further text proposals to be generated for the next meeting. See R1-01-1102.

13. Closing

The WG1 HSDPA Ad Hoc meeting was closed 4 PM.

9. WG1 meeting schedule in year 2000 -2002(Tentative)

Meeting	Year	Month	Date	Location	Hosts
RAN WG1 #10	2000	January	18-21	Beijing, China	Nokia
RAN WG1 #11	2000	February	29 – March 3	San Diego, CA, U.S.A.	TIP1
RAN #7	2000	March	13-15	Madrid, Spain	
RAN WG1 #12	2000	April	10-13	Seoul, Korea	TTA
RAN WG1 #13	2000	May	22-25	Tokyo, Japan	NTT DoCoMo
RAN #8	2000	June	21-23	Dusseldorf, Germany	
RAN WG1 #14	2000	July	4-7	Oulu, Finland	Nokia
RAN WG1 #15	2000	August	22-25	Berlin, Germany	Siemens
RAN #9	2000	September	20-22	Hawaii, U.S.A.	North American Friends of 3GPP
RAN WG1 #16	2000	October	10-13	Pusan, Korea	Samsung, LGIC
RAN WG1 #17	2000	November	21-24	Stockholm, Sweden	Ericsson
RAN #10	2000	December	6-8	Bangkok, Thailand	Unisys
RAN WG1 #18	2001	January	15-18	Boston, U.S.A.	North American Friends of 3GPP
RAN WG1 #19	2001	February	27 – March 2	Las Vegas, U.S.A.	Motorola
RAN #11	2001	March	13-16	Palm Springs, CA U.S.A.	North American Friends of 3GPP
HSDPA Ad Hoc	2001	April	5-6	Sophia Antipolis with R2	ETSI
RAN WG1 #20	2001	May	21-25 (5days)	Pusan, Korea with R2,3	Samsung
RAN #12	2001	June	12-15	Stockholm, Sweden	Ericsson
Rel-5 Ad Hoc	2001	June	26-28	Espoo, Finland	Nokia
RAN WG1 #21	2001	August	27-31(5days)	Turin, Italy	TiLab
RAN #13	2001	September	18-21	Beijing, China	Lucent, CWTS
HSDPA Ad Hoc	2001	November	5-7	Sophia Antipolis	ETSI
RAN WG1 #22	2001	November	19-23	Korea	Samsung
RAN #14	2001	December	11-14	Kyoto, Japan	ARIB, TTC
RAN WG1 #23	2002	January	8-11	TBD	
RAN WG1 #24	2002	February	5-8	USA (tentative)	
RAN #15	2002	March	5-8	(Korea)	TTA
RAN WG1 #25	2002	April	9-12	TBD	
RAN WG1 #26	2002	May	14-17	TBD	
RAN #16	2002	June	4-7	(Europe)	Motorola
RAN WG1 #27	2002	June	25-28	TBD	
RAN WG1 #28	2002	August	20-23	TBD	
RAN #17	2002	September	3-6	(France)	Alcatel
RAN WG1 #29	2002	September	24-27	TBD	
RAN WG1 #30	2002	November	12-15	TBD	
RAN #18	2002	December	3-6	(U.S.A.)	North American Friends of 3GPP

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