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TSG-RAN WG1/WG2 joint meeting HSDPA
Sophia Antipolis, France, 5 - 6 April 2001

12A010045

Title: Approved report of the joint TSG-RAN WG1/WG2 meeting on HSDPA
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1 Opening of the meeting

Denis Fauconnier (TSG-RAN WG2 Chairman) welcomed the delegates to ETSI and explained the logistics of the meeting. This meeting was intended to co-ordinate the efforts on HSDPA between WG1 and WG2 now that the Study Item was finished and the work on the Work Item would start.

1.1 Call for IPR

Denis Fauconnier (Chairman) reminded the delegates of their obligations with respect to IPRs, explaining that IPRs should be declared to the Director-General or Chairman of the SDO, not to the WG2 Chairman.

2 Approval of the agenda

12A010001 Draft Agenda (Chairman)

Denis Fauconnier (Chairman) proposed the agenda for the meeting.

Decision: The agenda was approved.

3 RAN report and Work Items presentation

12A01003525.950 v4.0.0 (MCC)

This was the approved WG2 TR on HSDPA.

Decision: Section 6.2 would be moved to the new TR on the Work Item. In section 6.4, the fifth bullet would be changed to "may be associated with either DPCH, S-CCPCH or standalone. (which case(s) is/are supported is FFS)". It was clarified that multiple antenna techniques may be used, but this was a physical layer issue that was not needed to be captured in Section 6.4. In bullet with the number 1 (Transport block size), the text would be changed to "semi-static or dynamic (FFS)". With the changes to the fifth bullet and to the bullet number 1, Section 6.4 would also be moved to the new TR.

12A01003625.848 v4.0.0 (MCC)

This was the approved WG1 TR on HSDPA.

The TSG-RAN plenary had approved the TRs, the conclusion of which was that HSDPA was feasible. The general conclusions had been approved, but the detailed recommendations were only noted since the plenary did not want to restrict the work to the techniques discussed for the Study Item.

4 Presentation of proposed HSDPA features

4.1 Requirements and evaluation criteria on HSDPA

12A010018 Service Requirements for HSDPA (Vodafone Group)

Alan Law (Vodafone Group) presented this document.

Discussion: It was clarified that conversational was not part of HSDPA. Vodafone believed that the urban environment was expected to be key for the introduction of HSDPA. It was also clarified that the services

mentioned were the ones that Vodafone would like HSDPA to be used for, the ones to focus on (as a priority rather than exclusivity).

Decision: The document was noted.

12A010014 Requirements on HSDPA Feature (Ericsson)

Erik Dahlman (Ericsson) presented this document.

Discussion: In addition to the urban environments mentioned in 12A010018, it was recommended by this paper to look into indoor environments also.

Decision: The document was noted.

12A010003 Further buffer complexity and processing time considerations on HARQ (Nokia)

Esa Malkamäki (Nokia) presented this document.

Discussion: The proposal intended (as did 12A010014) to make a number of choices in parametrisation of the system (limiting the options).

Decision: The document was noted.

12A010017 Outstanding issues with HSDPA (Vodafone Group)

Alan Law (Vodafone Group) presented this document.

Discussion: It was clarified that from a UE point of view the cost would not go down (because Release '99 and Release 4 would continue to need to be supported). A number of outstanding issues were highlighted that still needed to be studied from an operator perspective. It was clarified that a contribution had been presented at the last WG1 meeting on the power amplifier impacts of HSDPA with the conclusion that the same performance amplifier for R'99 should be able to support HSDPA. It was suggested to involve expertise of WG4 to carry out the potential further analysis, addressing issues on the overall impact on the hardware of the Node B, starting from an analysis of re-usability of power amplifiers. WG4 should address the feasibility aspects of 64 QAM from their viewpoint.

Decision: The document was noted. It was agreed to involve WG4 in carrying out the potential further analysis.

Requirements

The following points were agreed (no particular order intended) and would be added as requirements for the TR in a requirements section:

- Use HSDPA for streaming, background and interactive class, not conversational class;
- Improve system also by reduction of delay;
- Prioritise urban environment (macro/micro), then indoor deployment (pico cells), but not restricted to these;
- Accept features (or group of features) that bring significant incremental gains;
- Limit costs for operators (value per feature....);
- Provide certain features as UE capability parameters, i.e. not all features will be mandatory;
- Limit number of parameters and options;
- Ensure compatibility with advanced antenna and receiver techniques;
- Take into account processing time vs. memory requirements;
- Provide full mobility support, i.e., mobility should be supported for high-speed cases also, but optimisation should be for low-speed to medium-speed scenarios;
- Take into account impact on R'99 network equipments and interfaces, in particular Node B;
- Minimise UE complexity for a given performance;
- Evolve from R'99 instead of revolutionise.

4.2 Simulation assumptions

12A010016 Refinement of simulation assumptions for HSDPA capacity evaluation (Vodafone Group)

Yannick LePezennec (Vodafone Group) presented this document.

Discussion: It was clarified that the model used in WG1 so far could be found in the TR 25.848 (subclause 10.3.3). Table 2 was intended as an example only, not as a proposed model. It was stated that '0 km per hour' was difficult to simulate, and that '1 km per hour' would probably show the results that were needed for the 0 km per hour case. It was clarified that the static case needed to be looked at. The detail of how to model that case could be discussed later. The case for '10 users' was understood to model the "more-than-10-users" case while being reasonable to simulate. The refinement of assumptions could be done by experts for the next WG1 meeting. The simulations proposed here were intended to be run in the autumn to see what HSDPA would bring once decisions had been taken. Some of the contents on Table 2 were not really simulation assumptions, but parameters on which no decision had been taken yet.

Decision: The document was noted.

12A010034 Fairness Criteria for HSDPA evaluation simulations (Qualcomm Europe)

Serge Willenegger (Qualcomm Europe) presented this document.

Discussion: Neither the C/I method nor the Round Robin method was satisfactory for scheduling. It was commented that RLC (layer 2) should be on top (taking into account RNC and Node B). There were then two repetition layers (if the delay was assumed to be infinite (unrealistic), very nasty looping could follow), which meant that WG2 should first study the interactions. The proposal was not to specify a particular scheduler, but to define the criteria that an allowed scheduler should satisfy for simulation purposes. The scheduler algorithm should ideally be submitted with simulation results to allow experiments to be repeated.

Decision: The document was noted.

Conclusion

- WG2 would evaluate the interactions between RLC and Node B scheduler/retransmission;
- WG2 would define the expected services, e.g. BLER, delay from MAC-HS-DSCH. WG2 would evaluate the requirements on the Node B scheduler. These results will be given to WG1 for further refinement and usage in simulations;
- WG1 and WG2 would define simulation assumptions for their respective parts;
- Simulations would assess the performance benefits of HSDPA as requested in 12A010016. Details were to be discussed;
- Simulations for evaluation of given feature or for comparisons would be decided on a case-by-case basis;
- Whether or not to have RLC in the simulations in the future is f.f.s. Preference would be to do without it in order to simplify simulations.

4.3 Presentations

4.3.1 General

12A010020 High Speed Downlink Packet Access (HSDPA) - Overview (Motorola)

Amitava Ghosh (Motorola) presented this document.

Discussion: The regularity in the example on slide 11 was not intended to mean something, it was just an example. It was clarified that the document represented Motorola's view, not TSG-RAN WG1's view.

Decision: The document was noted.

4.3.2 MAC and HS-DSCH model

12A010011 MAC architecture model for HSDPA (Siemens)

Christina Gessner (Siemens) presented this document.

Discussion: From a modelling point of view, the functionality could be said to be Layer 3 (and as such be put in the RNC) or Layer 2 (and be put in MAC). It was better to keep the function for Hybrid ARQ separate from that of allocating resources.

Decision: The document was noted. Following the conclusions on the MAC architecture model, a revision was provided in 12A010040.

12A010040 MAC architecture model for HSDPA (Siemens)

This document was the update of the MAC architecture model. It was captured in TR 25.855 (21A010042).

12A010026 Physical layer model for HSDPA (Ericsson)

Joakim Bergström (Ericsson) presented this document.

Discussion: It was clarified that, although the physical channel could go to more UEs, the logical channels were per UE. The exact contents of the indicator were not intended to be discussed in detail in this meeting. There was a timing issue. Some misunderstanding might be due to the use of the word "flag" (which appeared not to indicate a one-bit toggle in this case). The model was compatible with beamforming if you scheduled one UE at a time. In the model, there was always a dedicated channel. From signalling point of view and usage of channels, there was no difference with Release' 99. The model was for FDD, but could be adapted for TDD to some extent.

Decision: The document was noted. Following the conclusions on the MAC architecture model, a revision was provided in 12A010041.

12A010041 Physical layer model for HSDPA (Ericsson)

This document was the update of the Physical layer model. It was captured in TR 25.855 (21A010042).

12A010025 TrCH multiplexing (interaction of L1/L2) (Lucent Technologies)

Farooq Khan (Lucent Technologies) presented this document.

Discussion: For what slide 3 (both left and right hand side) apparently tried to achieve, nothing new was needed, since R'99 already supported this. The main difference with 12A010026 (the Ericsson proposal) was that multiple HS-DSCH transport channels per user were proposed, but time-scheduled (they could have different TTI).

Decision: The document was noted.

12A010031 Semi-Static Code Space Division of Physical HS-DSCH (Lucent Technologies)

Farooq Khan (Lucent Technologies) presented this document.

Discussion: This was an extension to 12A010025. The preferred mode was the one described in that document, but this extension could be used if necessary. The extension needed more overhead. The main difference with the Motorola proposal was that the information would need to be broadcast, while the Motorola proposal used dedicated channels. It was not entirely clear which would be better from power consumption point of view. It was commented that the issue of dynamic TTIs should be separated. With respect to mapping TFCs and codes in Node B, it was also commented that there might be a misunderstanding of what R'99 allowed. It was not RRC but MAC that managed the code tree. It was stated that the main point of the contribution was on how to devise the control channel signalling. On page 11, 2nd

bullet, a difference with R'99 was the use of "clever rules" (implicit allocation based on what is broadcast). This would allow for example to move part of the code tree without RRC signalling.

Decision: The document was noted.

Conclusion

On MAC architecture model:

- A feedback channel should be indicated directly (figure 3 in 12A010011);
 - Resource allocation and Hybrid ARQ would be kept separate in the model;
 - The RR handler should be removed;
 - For the UE side having more than one DSCH was tbd;
 - For now, additional functionality would be "in square brackets";
 - A note on the UE Id would be added to say it was tbd.
- ==> A revision was provided in 12A010040.

On physical layer model:

- One proposal for the physical layer model:
 - There would be an associated DPCH;
 - Two level approach;
 - Other proposals would have to be made in May co-located meetings in Pusan;
 - After May, select 1 (or several if shown beneficial);
 - Multiple HS-DSCH in a CCTrCH or only 1 is ffs;
 - One HS-DSCH per CCTrCH in the same TTI.
- ==> A revision was provided in 12A010041.

On code space division:

- A contribution should be brought to WG2 to describe
 - Usage of the mapping table;
 - Requirements in terms of signalling broadcast;
 - Requirements on the UE;
- The outcome in WG2 would be discussed in the May co-located meetings.

4.3.3 HARQ

12A010015 Proposals for HSDPA Feature (Ericsson)

Erik Dahlman (Ericsson) presented this document.

Discussion: There was some confusion on the terminology "synchronous"/"asynchronous". In this contribution "synchronous" was used when the channel number was identified implicitly by the timer.

Decision: The document was noted.

12A010027 HARQ requirements (Ericsson)

Johan Torsner (Ericsson) presented this document.

Discussion: The request was to have the section 2 included in the TR. From SDU delay the beginning of the sentence "A low average" would be deleted. Delay variations would be added. Link throughput would be added. In 2.1 the first sentence of the last paragraph would be deleted, and also the first part of the second sentence in that paragraph (so that what was left read "This needs to be considered...").

Decision: The document was noted. With the changes described the requirements (Section 2) would be included in the TR.

12A010030 A2IR for HSDPA - hsdpa features, high level presentation (Lucent Technologies)

Farooq Khan (Lucent Technologies) presented this document.

Discussion: With respect to gains, the capacity for the whole system should be looked at.

Decision: The document was noted.

12A010013 Quad-channel Stop and Wait HARQ in TDD Mode (Siemens)

Thomas Stadler (Siemens) presented this document.

Discussion: It was commented in general that FDD and TDD should be as aligned as possible. This was qualified as being valid mainly for Iub and RNC, and UE memory complexity.

Decision: The document was noted.

Conclusion

- The protocol would be worked on in WG2 and when some more decisions had been taken there, the results would be discussed with WG1 in the May meeting;
- WG1 could meanwhile work on the complexity performance and layer 1 overhead aspects;
- FDD and TDD should be as aligned as possible mainly for Iub and RNC, and UE memory complexity. To what extent alignment in the Node B (e.g. MAC) was necessary needed to be discussed;
- Proposals for Hybrid ARQ needed to be submitted latest for the May meeting.

4.3.4 SIG

12A010005 HSDPA related signaling parameters in downlink (Nokia)

Esa Malkamäki (Nokia) presented this document.

Discussion: The following table was proposed in the contribution:

Table 1: Summary of HS-DSCH related parameters in downlink.

Parameter	Before the HSDSCH data packet			Simultaneously with HSDSCH data packet		
	Min	Prop	Max	Min	Prop	Max
UE identification	1	1	16	-	-	-
MCS	2	2	3	-	-	-
HS-DSCH power level	0	0	n	-	-	-
Code channels	0	2	8	-	4	-
FHARQ process #	-	-	-	0	2	2
FHARQ redundancy version	-	-	-	0	0	2
FHARQ packet number	-	-	-	2	6	12
Signaling info	-	-	-	0	4	4
Power offset for uplink	-	-	-	0	2	4
Total	3	5	27+n	2	15	21

There were comments on the last two parameters. It was agreed to delete "Signaling info" because it was very confusing. What should be part of TFCI and what part of other signalling was for further study. The table needed to be reviewed.

Decision: The document was noted. An empty version of this table would be included in the TR and all proposals would show how they proposed to fill out that table.

12A010010 Signalling Requirements for HSDPA in TDD mode (Siemens)

Christina Gessner (Siemens) presented this document.

Discussion: It would be better to have a list of semantical information, similar to 12A010005. Exactly which messages etc. was too much detail at this stage. It was also better to separate uplink and downlink. For TDD-specific things, the semantic information could always be indicated as "TDD only" if it was not possible to use the same for FDD and TDD. It was clarified that "TDD" always applied to both 3.84 Mcps and 1.28 Mcps, unless specifically stated otherwise.

Decision: The document was noted. A revision would be provided to WG2.

12A010028 Variable DL channel condition feedback rate for HSDPA (SONY Corporation)

Katsutoshi Itoh (SONY Corporation) presented this document.

Discussion: To make clear it was not the measurement report, it would be called measurement feedback. A table was needed for the uplink signalling. Two cases needed to be studied: with or without measurement feedback. ACK/NACK would be in the table also. Measurement feedback rate might be fixed or determined by upper layers. The TDD parameters needed to be added as well. All this would be covered in the TR.

Decision: The document was noted. The relevant parts would be covered in the TR as described above.

12A010006 DL control channel structures for parameters sent before HS-DSCH TTI (Nokia)

Esa Malkamäki (Nokia) presented this document.

Decision: The document was noted. This would be handled in WG1.

12A010007 DL control channel structures for parameters sent simultaneously with HS-DSCH TTI (Nokia)

Esa Malkamäki (Nokia) presented this document.

Decision: The document was noted. This would be handled in WG1.

12A010012 Signalling and Data Transfer for HSDPA in TDD Mode : Modelling of Layer1/Layer2 interface (Siemens)

Fariba Raji (Siemens) presented this document.

Discussion: It was asked why a specific primitive was introduced, since FACH could transport anything and the only important thing was the Layer1/Layer2 interface (transport channel was independent of what happened above). It was explained that it looked like FACH, but that there were some important differences. If a new physical channel was needed, more evidence was needed to prove that it could not be done by an existing physical channel.

Decision: The document was noted. It would be captured in the TR that a new physical channel might be needed for TDD HSDPA (and add that it was TBD).

12A010019 Physical Layer Considerations for the Signalling Channels associated to the HS-DSCH in TDD (Siemens)

Olaf Pollakowski (Siemens) presented this document.

Discussion: It was better to show why changes to the existing situation were needed. This would also help in getting support for changes (this comment was generally valid, not simply for this contribution). If provided in such a way, WG2 could discuss the issue better. Comments could be provided to Siemens directly.

Decision: The document was noted.

4.3.5 TTI

12A010023 Variable TTI for HSDPA - hsdpa features, high level presentation (Lucent Technologies)

Ashok Rudrapatna (Lucent Technologies) presented this document.

Discussion: Multi-user-diversity referred to scheduling gains.

Decision: The document was noted.

12A010002 HSDPA Transport channel data rate granularity with fixed TTI length (Nokia)

Esa Malkamäki (Nokia) presented this document.

Discussion: Comments were provided in 12A010037.

Decision: The document was noted.

12A010037 Comments on HSDPA variable TTI contribution (Lucent Technologies)

Nandu Gopalakrishnan (Lucent Technologies) presented this document.

Discussion: This was commenting on 12A010002. It was clarified that the proposal of 64QAM would be an optional feature.

Decision: The document was noted. Incremental vs. Chase would be handled in WG1. Asynchronous operation would be studied as part of Hybrid ARQ in WG2. Variable TTI was an addition to the semi-static TTI which needed to be supported by the standard. Its merits compared to semi-static would need to be shown as an incremental gain in WG1 and WG2. Both groups would resynchronise on the subject in the co-located meeting in Pusan in May.

12A010015 Proposals for HSDPA Feature (Ericsson) (see 4.3.3)

12A010039 Discussion on TTI parametrisation (Nortel Networks)

Evelyne Le Strat (Nortel Networks) presented this document.

Discussion: The idea of semi-static was to have one value for 10 ms and one value for lower than 10 ms. The exact optimum needed to be studied. The document proposed not to use variable TTI.

Decision: The document was noted. More contributions were invited. The choice of one fixed, two semi-static or multiple semi-static values was left open for now.

4.3.6 Downlink CChannel

12A010021 Control Channel Structure for HS-DSCH (Motorola)

Amitava Ghosh (Motorola) presented this document.

Discussion: The term "scrambling" code should have been "channelisation" code. One code for each user would result in spreading gain. The "shared dedicated" channel indicated a shared channel that was dedicated for a short period of time (with associated possibility of power control, beamforming etc.). It was asked how many users would typically be DCH+DSCH "state". The reason for that was that if the number was 128, this would eat something like 25% of the codes and a more efficient way might be needed, but if it was 32 or 64, the amount of codes necessary was negligible. It was clarified that the proposal was based on a two level approach (as described in agenda item 4.3.2).

Decision: The document was noted.

12A010029 Discussion on TFCI for E-DSCH (Panasonic)

Hidetoshi Suzuki (Panasonic) presented this document.

Discussion: Method 1 was acknowledged not to work. The Motorola and Ericsson proposals could more or less be mapped on Method 3, although it could also be said that the Motorola proposal was Method 2. A Nokia proposal was a mixture of Method 2 and Method 3.

Decision: The document was noted.

12A010024HS-DSCH timing considerations (signalling) (Lucent Technologies)

Farooq Khan (Lucent Technologies) presented this document.

Discussion: Following earlier discussion, the proponent thought it would be worthwhile investigating the one level approach as well, though this document was based on the two level approach. The time between the scheduling decision and the actual moment that it can be sent had been investigated by Nokia and was in the order of 3 slots (2 ms) minimum (which would be difficult for the UE).

Decision: The document was noted.

Summary

- Two step approach:

	On DPCH	On DSCH CC	DSCH C Channel	
Method A	1 bit	TFCI	1 CDM, N UE per TTI	
Method B	Pointer to the "dedicated" DSCH control channel	TFCI	N (8) CDM channels, 1 per UE per TTI	
Method C	Part of TFCI	Part of TFCI	1 CDM, N UE per TTI	

- Candidates for contents on DSCH CC
 - TFCI;
 - Scheduling (RR allocation) info;
 - HARQ info.
- The delay assumption between the scheduling decision and sending on block on HS-DSCH was a minimum of 3 slots, but because of processing time in UE, encoding of indicators, and advanced receivers, more was expected.
- The main (possibly conflicting) aspects to take into account when taking a decision on the signalling:
 - Delay;
 - Robustness of signalling;
 - Amount of signalling allowed;
 - UE complexity (processing time).
- WG2 would provide some requirements to WG1 and WG1 would further discuss this in the May meeting before the next joint meeting with WG2.

4.3.7 Uplink CChannel

12A010008HSDPA signaling in uplink (Nokia)

Esa Malkamäki (Nokia) presented this document.

Discussion: There was a question on whether the reference to CPICH SIR was intentional. In clarification, it was explained that a Study Item to re-introduce SIR had been approved at the TSG-RAN plenary. The issue was open for discussion.

Decision: The document was noted. More consideration time was needed before conclusions could be drawn.

12A010009Uplink channel structure for HSDPA (Samsung)

This document was withdrawn.

4.3.8 RLC

12A010033 RLC operation with HSDPA (Nokia)

There was no time left to handle this document. It could be brought directly to the relevant WG (WG2).

4.3.9 AMC

12A010015 Proposals for HSDPA Feature (Ericsson) (see 4.3.3)

12A010038 Enhanced Symbol Mapping method for the modulation of Turbo-coded bits based on bit priority (Samsung)

This document was replaced by 12A010044.

12A010044 Enhanced Symbol Mapping method for the modulation of Turbo-coded bits based on bit priority (Samsung)

Hunkee Kim (Samsung) presented this document.

Discussion: The contribution contained a lot of details and would be handled in WG1 directly. Questions could, however, be addressed to Samsung.

Decision: The document was noted. This would be studied further in WG1.

4.3.10 FCS

12A010004 Simulations on FCS benefits (Nokia)

There was no time left to handle this document. It could be brought directly to the relevant WG (WG1).

There was a specific SI for this issue.

4.3.11 MIMO

12A010022 Impact of MIMO Technology in HSDPA (Lucent Technologies)

There was no time left to handle this document. It could be brought directly to the relevant WG (WG1).

There was a specific WI for this issue.

4.3.12 RECAP

12A010032 Rel'5 HSDPA considerations (Nokia)

This document was replaced by 12A010043.

12A010043 Rel'5 HSDPA considerations (Nokia)

Decision: The document was noted.

5 Physical layer model, and services to upper layers

Because the meeting had been handled somewhat differently from the original intention, all contributions were handled in other (subclauses).

6 Conclusions and way forward in RAN1 and RAN2

12A010042 Draft TR 25.855 v0.0.1 on High Speed Downlink Packet Access (Rapporteur)

Ravi Kuchibhotla (Rapporteur) presented this document.

Discussion: The TDD parameters were missing. A note needed to be added that the signalling requirements might not be complete. References were missing. It would be added that a new physical channel might be needed for TDD (tbd). The sentence below figure 2 would be deleted.

Decision: The document was noted. Comments could be provided until Monday midnight Pacific time and the report would be considered endorsed after that.

7 Any other business

There was no input for this agenda item.

8 Closing of the meeting

Denis Fauconnier (Chairman) closed the meeting and thanked the delegates for their work and attendance. A follow-up joint meeting between WG1 and WG2 would be held during the co-located May meeting (Pusan). WG4 also needed to do some work (for instance on 64QAM). A reminder would be sent to them.

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TSG-RAN 12A010045 - Draft Report of TSG-RAN WG1/WG2 meeting on HSDPA (Sophia Antipolis, France, 5 - 6 April 2001)

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TSG-RAN 12A010045 - Draft Report of TSG-RAN WG1/WG2 meeting on HSDPA (Sophia Antipolis, France, 5 - 6 April 2001)

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TSG-RAN 12A010045 - Draft Report of TSG-RAN WG1/WG2 meeting on HSDPA (Sophia Antipolis, France, 5 - 6 April 2001)

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Annex B: List of documents

Doc.No	Title	Source	Ag.It.	Revised by
12A010001	Draft Agenda	Chairman	2	
12A010002	HSDPA Transport channel data rate granularity with fixed TTI length	Nokia	4	
12A010003	Further buffer complexity and processing time considerations on HARQ	Nokia	4	
12A010004	Simulations on FCS benefits	Nokia	4	
12A010005	HSDPA related signaling parameters in downlink	Nokia	4	
12A010006	DL control channel structures for parameters sent before HS-DSCH TTI	Nokia	4	
12A010007	DL control channel structures for parameters sent simultaneously with HS-DSCH TTI	Nokia	4	
12A010008	HSDPA signaling in uplink	Nokia	4	
12A010009	Uplink channel structure for HSDPA	Samsung	4	
12A010010	Signalling Requirements for HSDPA in TDD mode	Siemens	4	
12A010011	MAC architecture model for HSDPA	Siemens	4	12A010040
12A010012	Signalling and Data Transfer for HSDPA in TDD Mode: Modelling of Layer1/Layer2 interface	Siemens	4	
12A010013	Quad-channel Stop and Wait HARQ in TDD Mode	Siemens	4	
12A010014	Requirements on HSDPA Feature	Ericsson	4	
12A010015	Proposals for HSDPA Feature	Ericsson	4	
12A010016	Refinement of simulation assumptions for HSDPA capacity evaluation	Vodafone Group	4	
12A010017	Outstanding issues with HSDPA	Vodafone Group	4	
12A010018	Service Requirements for HSDPA	Vodafone Group	4	
12A010019	Physical Layer Considerations for the Signalling Channels associated to the HS-DSCH in TDD	Siemens	4	
12A010020	High Speed Downlink Packet Access (HSDPA) - Overview	Motorola	4	
12A010021	Control Channel Structure for HS-DSCH	Motorola	4	
12A010022	Impact of MIMO Technology in HSDPA	Lucent Technologies	4	
12A010023	Variable TTI for HSDPA - hsdpa features, high level presentation	Lucent Technologies	4	
12A010024	HS-DSCH timing considerations (signalling)	Lucent Technologies	4	
12A010025	TrCH multiplexing (interaction of L1/L2)	Lucent Technologies	4	
12A010026	Physical layer model for HSDPA	Ericsson	4	12A010041
12A010027	HARQ requirements	Ericsson	4	
12A010028	Variable DL channel condition feedback rate for HSDPA	SONY Corporation	4	
12A010029	Discussion on TFCI for E-DSCH	Panasonic	4	
12A010030	A2IR for HSDPA - hsdpa features, high level presentation	Lucent Technologies	4	
12A010031	Semi-Static Code Space Division of Physical HS-DSCH	Lucent Technologies	4	
12A010032	Rel'5 HSDPA considerations	Nokia	4	12A010043
12A010033	RLC operation with HSDPA	Nokia	4	
12A010034	Fairness Criteria for HSDPA evaluation simulations	Qualcomm Europe	4	
12A010035	25.950 v4.0.0	MCC	3	
12A010036	25.848 v4.0.0	MCC	3	
12A010037	Comments on HSDPA variable TTI contribution	Lucent Technologies	4	
12A010038	Enhanced Symbol Mapping method for the modulation of Turbo-coded bits based on bit priority	Samsung	4	12A010044
12A010039	Discussion on TTI parametrisation	Nortel Networks	4	
12A010040	MAC architecture model for HSDPA	Siemens	4	
12A010041	Physical layer model for HSDPA	Ericsson	4	
12A010042	Draft TR 25.855 v0.0.1 on High Speed Downlink Packet Access	Rapporteur	4	

TSG-RAN R2-010002 - Draft Report of the 17th TSG-RAN WG2 meeting (Sophia Antipolis, France, 13 - 17 November 2000)

Doc.No	Title	Source	Ag.It.	Revised by
12A010043	Rel'5 HSDPA considerations	Nokia	4	
12A010044	Enhanced Symbol Mapping method for the modulation of Turbo-coded bits based on bit priority	Samsung	4	
12A010045	Approved report of the joint TSG-RAN WG1/WG2 meeting on HSDPA (Sophia Antipolis, France, 5 - 6 April 2001)	Secretary		