Status Report for WI to TSG

Work Item Name: FDD Enhanced Uplink (All building blocks)

Building Block	Acronym	WG
FDD Enhanced Uplink - Stage 2	EDCH-Stage2	R2
FDD Enhanced Uplink - Physical Layer	EDCH-Phys	R1
FDD Enhanced Uplink - Layer 2 and 3 Protocol Aspects	EDCH-L23	R2
FDD Enhanced Uplink - UTRAN Iub/Iur Protocol Aspects	EDCH-Iurlub	R3
FDD Enhanced Uplink - RF Radio Transmission/ Reception, System Performance Requirements and Conformance Testing	EDCH-RF	R4

Note: Work Items for Stage 2 (RAN2), Physical Layer (RAN1), Layer 2 and 3 (RAN2), Iub/Iur (RAN3) are completed. However, TSG RAN requested in its last meeting that their status is still reported for the RAN2 and RAN3 activities. RAN4 work is ongoing. The three Status Reports are merged in this file

SOURCE: Rapporteurs, 3GPP Support **TSG:** RAN **WG:** RAN1, RAN2, RAN3, RAN4

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Ref. to WI sheet: ftp://ftp.3gpp.org/tsg_ran/TSG_RAN/Work_Item_sheets/

RAN WG2 Progress Report since the last TSG:

Since last TSG RAN plenary there were 2 regular TSG RAN WG2 meetings held:
TSG RAN WG2 #46bis in Beijing, China, 4th - 8th of April 2005 and
TSG RAN WG2 #47 in Athens, Greece, 9th - 13th of May 2005.

Both at RAN2#46bis and RAN2#47 2.5 days each was spent on enhanced uplink.

For RRM it was concluded that:

- Current Total interference should be signaled from Node-B to CRNC
- Provided bit rate per priority class per cell should be signaled from Node-B to CRNC
- Cell interference overload should be indicated to the CRNC
- The scheduler should control non-serving E-DCH interference relative to serving E-DCH interference, according to a target signaled from the CRNC
- Power control stability is handled internally in the Node-B and that there is no need for Node-B to CRNC signaling to support this.

It was concluded that L3 signaling is used for TTI re-configuration and cell change.

Interaction between compressed mode and E-TFC selection was concluded.

Transport Block sizes for E-DCH were concluded.

Alternative options were removed for the scheduling mechanism:

- Non-RG mode with autonomous ramping is not part of the specifications
- Per-process/per-UE scheduling option was removed for 2ms TTI, and replaced by a simpler per-UE scheme with process activation

To enable request-free access with the remaining RG-mode, a scheduler enhancement was introduced:

- 2 E-RNTIs, a primary and a secondary, and precedence rules for their use

It was agreed that the relative grant commands from non-serving cells are cell-specific and cannot be combined by the UE. As a result, the concept of "non-serving radio link set" was replaced by single-cell "non-serving RL".

There was progress on the content of the scheduling information

- Total buffer occupancy is 5 bits
- Buffer for highest priority flow is 4 bits
- Non scheduled flows should not be considered

For the absolute grant channel it was concluded that:

- 6 bits of content is used
- Duration will not be included

Buffer size requirements for different UE categories were agreed.

RAN WG3 Progress Report since the last TSG:

FDD Enhanced Uplink WI received about one and a half day of meeting time in RAN3#47 (Athens). Document R3-050694 contains the latest version of the RAN3-internal TR (not completly reflecting most recent status of discussions) (R3.015 v0.4.0).

Significant progress has been made in reaching a stable status for the Iub/Iur congestion control framework, version 1.0.0 of TR 25.902 is provided for information, CRs for congestion control have been elaborated and are provided to RAN#28. Open Issues to be discussed further on can be found in the submitted version of the TR. It is expected that TR 25.902 will be ready for approval at RAN#29.

RAN3 has also achieved to align with most recent discussions on RRM in RAN1 and on stage 2 work in RAN2. Agreed CRs are available.

Specification of signalling of HARQ failures/number of retransmissions introduced to reflect output of discussion from RAN3#46 for OLPC.

The related frame protocol received some corrections and the introduction of a mechanism to allow flexibility for packaging data into E-DCH FP frames introduced (“Frame Bundling”).

For HSDPA, a signalling mechanism was introduced to switch on/off congestion control on a per-UE-context basis. For E-DCH a similar mechanism is still open.

The agreements made in this meeting will be captured in the next version of R3.015, which is expected to be closed after finalisation of the last open issues.

RAN WG4 Progress Report since the last TSG:

Two phone conferences, one RAN4 AdHoc and one regular RAN4 working group meeting was held since RAN#27.

The summary of the conclusions and agreements of the 4th phone conferences on 17th March 2005 and the 5th phone conference on the 14th April 2005 can be found in R4AH-05017 and R4-050295.
20 contributions on E-DPCCH testing, RRM measurements and measurement accuracy, simulation results for E-DPCCH and E-DPDCH requirements, alignment simulations for E-HICH requirements, and on E-DCH maximum active set size were presented in during the two phone conferences.

The RAN4 AdHoc was held on the 4th – 6th April in Sofia Antipolis, France. 37 documents on RRM measurements and measurement accuracy, simulation results for E-DPCCH and E-DPDCH requirements, alignment simulations for E-HICH requirements, impact of Active Set Size on Network performance, discussion on UE MPR requirements, E-TFC selection in the UE, and proposals for beta settings were presented. A longer discussion on the Active Set Size resulted in a proposed way forward, that a trade off would have to be found between the UE complexity and the uplink noise rise for the Network. Contributions evaluating the maximum set sizes of 3, 4, 5 and 6 would need to be presented. The necessarily of an indicative voting at RAN4#35 if no consensus could be reached was mentioned as well.

During RAN4#35, 51 documents on Summary of UL EUL Simulation Assumptions, Simulation results for E-DPCCH, E-DPDCH, and E-HICH, power settings for E-DPDCH test, CR text proposal for 25.101 on E-HICH and for 25.104 & 25.141 on E-DPDCH & E-DPCCH, test scenarios for E-RGCH and E-AGCH detection performance,

E-TFC and MPR, EUL Cell and User Throughput with Indoor-Penetration Loss and PA Power Back-Off, and input to the Active Set size discussion were presented. The ideal simulation results from different companies are well aligned so results including implementation margins to finalize the requirements can start - note that the results are still dependent on the final TB size decision in RAN2 and on the final power quantization decision in RAN1 and might need to be re-checked. R4-050319 and R4-050320 were agreed as basis for the CRs for TS 25.104 and TS 25.141 with implementation margin to be added.
Two CR:s on E-TFC selection in R4-050544 to Rel-6 TS 25.133 and UE maximum output power with HS-DPCCH & EDCH in R4-050545 to Rel-6 TS 25.101 were approved.
On Active Set Size discussion the task is to find consensus between UE complexity and the impact on network performance based on UL noise rise increase. There are simulations supporting both view, small and large AS size. It is unlikely that further simulation results help to reach a conclusion. An indicative voting during RAN4#35 on the Active Set Size values of 3, 4, 5, and 6 showed an approximately equal split of votes for each of the AS sizes.

As a way forward for the WI it was agreed to have two phone conferences (#6 and #7) in June and August in addition to the RAN4#36 meeting to finalize the RAN4 work at RAN#29, September 2005. The finalization date of September is still foreseen as aggressive.

List of Completed elements (for complex work items):

RAN WG2

Stage 2 TS 25.309 was already approved at RAN#25, September 2004.

CRs to the following impacted RAN2 specifications were already approved at RAN#26, December 2004:

- TS 25.301
- TS 25.302
- TS 25.321
- TS 25.331

CR to TS 25.306 was approved at RAN#27, March 2005.

RAN WG3

- RRM signalling for target RTWP and Provided Bitrate per logical channel introduced
- Basic solution for TNL-Congestion-Control HSDPA/E-DCH
  - congestion detection for HSDPA/E-DCH via counters/timestamps
  - for HSDPA NodeB may exploit exiting Flow Control for congestion control
  - for E-DCH, a Congestion Control Frame was added
- Flexibility for packaging data into E-DCH FP frames introduced (“Frame Bundling”)

RAN WG4

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List of open issues:

RAN WG2

- Some remaining scheduler details. E.g.
  - Detailed absolute grant content and value ranges.
  - Detailed Scheduling Information value ranges
  - Workarounds to handle of 5% error rate on the relative grant channel
  - Step size of the Relative Grants from serving cell
- Refinements of UE capability.
- Testing aspects. I.e. testing methodology and Radio bearers.

RAN WG3

- Feasibility of measurements allowing to discriminate the UL interference (or RoT) due to E-DCH traffic from the total UL interference (or RoT)
- Completion of the overall Iub/Iur congestion control framework, among others: applicability of the HSDPA/E-DCH solution for DCH in UL/DL, Rate Adaptation, impacts of SHO.
- Control of Congestion Control for E-DCH for particular flows

RAN WG4

- Power ratios for the non-RX diversity case
- Implementation Margins
- Active Set Size for E-DCH
- Re-check the simulation results on E-DPDCH and E-DPCCH since there are dependent on the final TB size decision in RAN2 and on the final power quantization decision in RAN1.
- Ideal simulation results & with implementation margin for DL channels for EUL for test scenarios.

- E-TFC finalization
- RRM measurements depending on RAN1 & RAN2 ongoing work

Estimates of the level of completion (when possible):

Stage 2: 100%
Physical Layer: 100%
Layer 2 and 3 Protocol Aspects: 100%
UTRAN Iub/Iur Protocol Aspects: 100%

RF Radio Transmission/ Reception: **60%**

WI completion date review resulting from the discussion at the working group:

Stage 2: December 2004
Physical Layer: March 2005
Layer 2 and 3 Protocol Aspects: March 2005
UTRAN Iub/Iur Protocol Aspects: March 2005

RF Radio Transmission/ Reception: **September 2005**

References to WG's internal documentation and/or TRs:

R3-050694 R3.015 v0.4.0 FDD Enhanced Uplink: UTRAN Iub/Iur Protocol Aspects
TR 25.902v1.0.0 IubIur Congestion Control

RAN4#35:

R4-050295	Summary of the 5th EUL Phone Conference; Ericsson
R4-050296	Test Scenarios for E-RGCH Detection Performance in Soft Handover; Ericsson
R4-050297	A Test scenario for E-AGCH Detection Performance; Ericsson
R4-050299	Impact of Active Set Size on Enhanced UL System Performance; Ericsson
R4-050313	Power settings for new FRCs for E-DPDCH test; Ericsson
R4-050314	Beta_ec for E-DPCCH test; Ericsson; Ericsson
R4-050315	EUL UL Simulation Assumptions; Ericsson
R4-050316	Simulation results for E-DPDCH; Ericsson
R4-050546	Simulation results for E-DPCCH; Ericsson
R4-050319	Text proposal for EUL CR for 25.104; Ericsson
R4-050320	Text proposal for EUL CR for 25.141; Ericsson
R4-050321	Collection of Simulation results for EUL UL for old FRCs; Ericsson
R4-050322	Text proposal for 25.101 on E-HICH; Ericsson, Nokia; NTT DoCoMo
R4-050323	Collection of Simulation results for E-HICH; Ericsson
R4-050333	UE E-TFC and MPR; Motorola
R4-050544	UE maximum output power with HS-DPCCH & EDCH; Motorola
R4-050545	E-TFC selection in the UE; Motorola
R4-050336	UE and UTRAN/Node B EDCH Active set size; Motorola
R4-050337	Maximum size of active set for HSUPA; Motorola
R4-050349	Proposal for FRC2 DPCCH/E-DPDCH amplitude/power ratios; Nokia
R4-050350	Simulation results for E-DPCCH; Nokia
R4-050371	E-HICH simulation results; ZTE
R4-050372	E-AGCH Test Case and Simulation Results; ZTE
R4-050418	Maximum Active Set Size for E-DCH; NEC
R4-050429	EUL Cell and User Throughput with Indoor Penetration Loss and PA Power Back-Off; Qualcomm
R4-050435	Simulation results for E-DPDCH performance; NEC
R4-050438	E-DPDCH simulation results; Samsung
R4-050439	E-DPCCH simulation results; Samsung
R4-050441	Discussion on Scheduling channel related requirements; Nokia
R4-050445	Simulation results for E-HICH requirement scenarios; Nokia
R4-050446	E-DPDCH simulation results; Siemens
R4-050447	E-DPCCH simulation results; Siemens
R4-050448	E-HICH simulation results; Siemens
R4-050449	E-DCH Active Set Size; Siemens
R4-050469	On SHO Addition/Drop WINDOW parameters; Mitsubishi
R4-050470	Transmit remaining power offset definition for E-TFC selection process; Mitsubishi
R4-050471	DPCCH/E-DPCCH power ratio for FRC#7; Lucent
R4-050494	Simulation results of E-HICH; Panasonic
R4-050496	E-DPDCH/DPCCH Power Ratio Proposal for FRC2; Motorola
R4-050497	E-DPDCH Ideal Simulation Results; Motorola
R4-050498	E-DPCCH Ideal Simulation Results; Motorola
R4-050510	E-HICH simulation results; Fujitsu
R4-050515	E-DPCCH simulation results; NTT DoCoMo
R4-050540	Comments on R4-050299; Motorola
R4-050544	E-TFC selection in the UE; Motorola
R4-050545	UE maximum output power with HS-DPCCH & EDCH; Motorola

R4-050546	E-DPCCH simulation results; Ericsson
R4-050547	Collection of simulation results for EUL UL; Ericsson
R4-050558	Report of the discussion on test scenarios for EUL DL control channels; Qualcomm
R4-050567	Way forward – EUL; Ericsson
R4-050585	Compilation of E-HICH simulation results; Ericsson

RAN4 AdHoc on MBMS and Enhanced UL:

R4AH-05002	E-DPDCH simulation results; Samsung
R4AH-05004	UTRAN Measurement for E-DCH RRM; Samsung
R4AH-05006	Transmit power margin definition for E-TFC selection process; Mitsubishi
R4AH-05007	On E-TFC selection scheme; Mitsubishi
R4AH-05008	E-DCH Maximum Active Set Size; Mitsubishi
R4AH-05009	E-HICH Simulation; Qualcomm
R4AH-05011	Accuracy of RTWP and RoT Measurements; Nokia
R4AH-05014	RoT Measurement Definition and Performance; Ericsson
R4AH-05015	Impact of Active Set Size on Network performance; Ericsson
R4AH-05016	Performance requirements for scheduling grant channels; Ericsson
R4AH-05017	EUL Phone Conference Summary; Ericsson
R4AH-05018	E-HICH System Scenarios and Assumptions; Ericsson
R4AH-05020	Collection of Simulation results for EUL UL; Ericsson
R4AH-05021	Proposal for Beta_Ec; Ericsson
R4AH-05022	Proposal for Beta_C; Ericsson
R4AH-05023	E-DPDCH definitions; Ericsson
R4AH-05024	E-DPCCH definitions and requirements; Ericsson
R4AH-05029	Comments on E-DCH RRM Measurements; Siemens
R4AH-05033	E-DPDCH/DPCCH Power Ratio Proposal; Motorola
R4AH-05034	E-DPDCH Simulation Results with Non-Ideal Channel Estimation; Motorola
R4AH-05035	E-DPCCH Simulation Results with Non-Ideal Channel Estimation; Motorola
R4AH-05036	Simulation results for E-HICH alignment; Nokia
R4AH-05038	Discussion on E-HICH requirements; Nokia
R4AH-05039	Discussion on UE MPR requirements; Nokia
R4AH-05043	E-DPDCH Simulation results; Panasonic
R4AH-05044	UE transmit power and CM; Mototola
R4AH-05045	UE transmit configurations and E-TFC selection; Motorola
R4AH-05046	E-TFC selection in the UE; Motorola
R4AH-05047	E-DPDCH simulation results; NEC
R4AH-05050	E-HICH simulation results; NTT DoCoMo
R4AH-05052	SA4 description of FEC schemes and simulation work; Nokia
R4AH-05054	Proposal for DPCCH/E-DPDCH power ratios; Lucent
R4AH-05055	E-DCH Simulation Results Update; Siemens
R4AH-05058	Comments to R4AH-05014; Nokia
R4AH-05060	E-DPCCH simulation results; NTT DoCoMo
R4AH-05064	E-DCH RRM measurement accuracy; RAN4 AdHoc
R4AH-05066	Decisions and further steps for Enhanced Uplink; Offline Group