

TSG RAN meeting #9
20 – 22 September 2000
Oahu, Hawaii

Agenda Item: 5.5

Source: ITU Ad Hoc Contact Person

Title: Proposed answer to the LS from ITU-R WP 8F on Updating
Recommendation ITU-R M.1457

Document for: Discussion & Approval

3GPP TSG RAN would like to thank ITU-R WP 8F for the Liaison Statement on the updating of Recommendation ITU-R M.1457.

3GPP TSG RAN appreciate that there is a need within ITU-R WP 8F to define a clear, swift and simple mechanism/process which can be deployed at the October 2000 meeting in order to distinguish between 'routine' minor updates and 'non-routine' major updates. As mentioned in the LS from ITU-R WP 8F, 3GPP TSG RAN believe that Recommendation ITU-R M.1455 can provide a good technical basis for such a distinction. All proposed changes to the existing terrestrial radio interfaces contained in ITU-R M.1457 that are consistent with their related parameters within ITU-R M.1455 can almost certainly be considered 'routine' update whereas inputs to ITU-R M.1457 that require modifications also to ITU-R M.1455 are most likely to be considered 'non-routine' updates, and as such carefully evaluated by ITU-R WP 8F.

In addition, changes to the RKEY parameters resulting from the support of new service requirements or affecting spectrum efficiency or regulatory issues should be considered non-routine. The impact on global compatibility, interoperability, and roaming is a key factor which must also be assessed and form part of the judgment. Using the above definition of routine and non-routine, External Organizations should quantify the impact of their proposed changes on these areas, justify the changes and provide this information to WP 8F as evidence that their update is routine, with WP 8F making the final decision after reviewing all proposed changes.

However, 3GPP TSG RAN believe that at this early stage of IMT-2000 any significant divergence from the terrestrial radio interfaces currently specified in ITU-R M.1457 should be carefully considered, due to possible concerns based also on market considerations.

3GPP TSG RAN would like to inform ITU-R WP 8F on the focus areas currently under consideration within 3GPP TSG RAN. It is noted in the liaison from ITU-R WP8F that one of the possible focus areas is increased data rates and changes to the radio interfaces to improve packet and/or IP based services and applications. 3GPP TSG RAN wishes to draw particular attention to its work item on high speed packet access, which proposes to enhance WCDMA to provide very high speed downlink packet access. The study is expected to address adaptive modulation and coding

schemes, hybrid ARQ protocols, the position of the scheduling function within UTRAN, and other advanced techniques. Annex 1 contains a complete list of the approved 'Work Items' sheets containing a brief description of the technical contents, some indication of the expected service/performance requirements, and the time-schedule foreseen at the moment. 3GPP TSG RAN will keep ITU-R WP 8F informed on the status of the Work Items activities.

With reference to the update process proposed by ITU-R WP 8F, 3GPP TSG RAN appreciate the efforts to accommodate the different work plans of the organizations external to ITU. In particular, the foreseen phased approach is considered a good way forward. In order to allow development of a common view on the multiple proposals that are likely to be developed for any one focus area, it is further suggested to require from External Organizations information (even in a preliminary stage) on all proposals by the June 2001 meeting of ITU-R WP 8F. This would allow for concurrent evaluation of all proposals.

For future revisions of Recommendation ITU-R M.1457, 3GPP TSG RAN believes that a single annual maintenance update interval should continue to be followed, accommodating both routine and non-routine updates. This would fit the internal 3GPP work plan. The time schedule currently proposed for the year 2000 revision should be used also for future revisions.

For changes deemed to be non-routine, the subsequent requirements definition in any one focus area and the process to be used for submission and evaluation of the proposals satisfying these may reflect to some extent the successful one used for the original development of ITU-R M.1457. Organizations external to ITU may be required to provide the results of their internal technical evaluations for consideration by ITU-R WP 8F.

For completeness, Annex 2 contains the dates of the future meetings of TSG RAN that may be considered by ITU-R WP 8F when further developing the process to accommodate 'non-routine' updates.

3GPP TSG RAN would like to continue fruitful liaison with ITU-R WP 8F on the future revisions of Recommendation ITU-R M.1457.

ANNEX 1

[The following is simply preliminary and incomplete text]

Changes to M.1457 based on R4 Work Items

Terminal power saving features: DPCCH gating:

Dedicated channel DPCCH fields (TPC, Pilot, TFCI) are gated off when UE is in Cell-DCH state with DSCH transmission active. Gating provides reduced interference in uplink and increases UE battery life. Radio interface specification changes take place in power control procedure and defining the means for initiation/termination of gating.

Radio link performance enhancements: DSCH PC in soft handover:

DSCH power control procedure in soft handover is extended such that UTRAN may use the SSdT signalling from UE to determine a power offset used for PDSCH. UE can transmit SSdT signaling in uplink even when it is in soft handover. Radio interface specification changes limit to changes in Node B power control algorithm and UE functionality in soft handover.

[Uplink synchronous transmission:]

A method for time-aligning the strongest multipaths from several UEs in Node B. This is achieved by sending timing adjustment commands to UEs which consequently shift transmission timing. Impacts to radio interface specification include defining the timing adjustment signaling format and frequency as well as specifying USTS functionality during soft handover.

[Hybrid ARQ]:

Hybrid ARQ is a so-called incremental redundancy ARQ scheme which means that an RLC-PDU that are to be retransmitted are not discarded but is combined with some incremental redundancy information provided by the transmitter for subsequent decoding. Soft combining requires side information for packet sequence numbers and redundancy version so that soft combining takes place correctly. The specification changes include the description of this side information and its mapping on physical layer as well as some further functionality in the channel encoding section.

UE Positioning:

Facilitates the mechanism for locating the actual geographical position of a UE. There are both air interface independent methods and methods that require changes in the radio interface specification. At the moment the impact of the methods affecting air interface is not evaluated.

R4 Work Item	Changes to radio interface specification
DPCCH gating	Initiation and termination indication of DPCCH gating. Power control procedure
DSCH PC in soft handover	UE in soft handover even when SSdT signaling active in uplink. Power control algorithm in the Node B for DSCH
USTS	Timing adjustment functionality for UE Soft handover functionality
Hybrid ARQ	Addition of Hybrid ARQ functionality to current ARQ protocol in RLC. Side information on RLC layer for sequence number and redundancy version information. Mapping of this side information on physical channel. Channel encoding in L1
UE positioning	Impact to L1 not evaluated yet

Changes to M.1457 based on the introduction of HSPA

HSPA is applied to an enhanced DSCH channel.

Adaptive modulation and coding schemes:

Link adaptation by selecting modulation and encoding method based on current link quality. Good link quality makes multilevel modulation possible and facilitates faster data rate.

Hybrid ARQ protocols:

Somewhat faster link adaptation scheme and operates together with adaptive modulation and coding. RLC-PDUs that are to be retransmitted are not discarded but is combined with some incremental redundancy information provided by the transmitter for subsequent decoding. For obtaining highest possible adaptation speed hybrid ARQ in HSPA takes place in L1.

Position of the scheduling function within UTRAN:

The scheduling functions needs to be relocated from RNC to the Node B thus allowing distributed scheduling across peer Node Bs. This allows retransmissions to be scheduled within a very short time.

Fast cell site selection:

For high data rate systems it is not desirable to implement soft-handoff since it introduces additional interference in the forward link and also tie up hardware resources at multiple base stations. The UE only receives HSPA transmission from one Node B. The transmitting Node B selection is updated every frame or so in order to have the best possible link quality between Node B and UE.

HSPA feature	Anticipated changes to radio interface specification
Adaptive modulation and coding	Additional modulation methods introduced (16-QAM, 64-QAM). Functionality for selecting modulation scheme and encoding rate. Definition and frequency of uplink feedback information for modulation/coding selection.
Hybrid ARQ protocols	Dual channel fast ARQ protocol operating on L1. Possible reduction on frame length to facilitate fast handshaking. Definition and frequency of uplink feedback information.
Position of the scheduling function	Scheduling function no longer in RRC but relocated to Node B.
Fast cell site selection	Definition and frequency of uplink feedback information. Node B functionality on enhanced DSCH

ANNEX 2

[3GPP TSGs future meetings dates]