TSG-RAN Meeting #21　　　　　　　　　　　　**RP-030434**
Frankfurt, Germany, 16 - 19 September 2003

Agenda Item:	**7.1.2**
Source:	**ITU-R Ad Hoc**
Title:	**Proposed Final submission for updated UTRA FDD and TDD toward Rev. 4 of Rec. ITU-R M.1457**
Document for:	**Approval**

[ITU Member][1]

UPDATED MATERIAL ON IMT-2000 CDMA DS AND IMT-2000 CDMA TDD
FOR REVISION 4 OF ITU-R M.1457

This contribution contains the updated material on IMT-2000 CDMA DS and IMT-2000 CDMA TDD for Revision 4 of Recommendation ITU-R M.1457 in line with 8/LCCE/95 and IMT/32.

In particular, the material required as specified in the update procedure for revisions of Recommendation ITU-R M.1457 (8/LCCE/95) is addressed in the following annexes:

Annex 1: update of Sections 5.1.2 & 5.3.2

Annex 2: modifications to Sections 5.1.1 and 5.3.1

Annex 3: updated GCS

Annex 4: summary and rationale of the proposed update

Annex 5: self-evaluation of the proposed update against the evaluation criteria

Annex 6: self-declaration that the proposed amendments are self-consistent between Section 5.1.1, Section 5.1.2, and the GCS, as well as between Section 5.3.1, Section 5.3.2, and the GCS.

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[1] This contribution was developed in 3GPP TSG RAN.

ANNEX 1*

Update of Sections 5.1.2 & 5.3.2

[See RT-030027 & RT-030029]

ANNEX 2

Modifications to Sections 5.1.1 and 5.3.1

[See RT-030026 & RT-030028]

ANNEX 3

Updated GCS

The updated set of the Global Core Specifications (GCS) for IMT-2000 CDMA DS and IMT-2000 CDMA TDD are available in Doc 8F/XXX *[See RP-030433]*.

ANNEX 4

Summary and Rationale of the proposed update

The main purpose of this update is to align Rec. ITU-R M.1457 to the most updated versions of the Specifications of IMT-2000 CDMA DS and IMT-2000 CDMA TDD, including some features of Release 6. In particular, following decision at WRC-2000, the relevant specifications have been updated to also include the 1900 MHz, 1800 MHz, 850 MHz, and 800 MHz bands as well as a pairing of parts, or whole, of 1710-1770 MHz as uplink with whole, or parts, of 2110-2170 MHz as downlink. In addition, information on HS-DSCH have been updated, as well as title and synopsis of some Specifications.

ANNEX 5

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* As per established procedures, not all stakeholder SDOs need necessarily to transpose each document.

Self-evaluation of the proposed update against the evaluation criteria

The self-evaluation of the "total" radio interfaces (update IMT-2000 CDMA DS and IMT-2000 CDMA TDD) has been made against all evaluation criteria listed in the update procedure contained in 8/LCCE/95. The results are that the proposed updates meet the evaluation criteria as follows:

7.1   "The Evaluation Criteria" (Section 7.1 in 8/LCCE/95)
The "requirements and Objectives of IMT-2000" and the "Minimum Performance Capabilities for IMT-2000" as per Attachments 4 and 6 of Circular Letter 8/LCCE/47 were considered. The values included in Circular Letter 8/LCCE/47 were used. The proposed updates consist of enhancements to the existing IMT-2000 CDMA DS and IMT-2000 CDMA TDD radio interfaces. The evaluation of the proposed update was done in the context of the "total" radio interface. As shown in the tables below, the conclusion is that the IMT-2000 CDMA DS and IMT-2000 CDMA TDD radio interfaces with the proposed enhancements continue to meet all evaluation criteria in "Requirements and Objectives of IMT-2000" and "Minimum Performance Capabilities for IMT-2000".

TABLE 1

**Requirements and Objectives Relevant to the Evaluation of
Candidate Radio Transmission Technologies**

IMT-2000 Item Description	Obj/Req	Source	Meets
Voice and data performance requirements			
1. One-way end to end delay less than 40 ms	Req	G.174, § 7.5	YES
2. For mobile videotelephony services, the IMT-2000 terrestrial component should operate so that the maximum overall delay (as defined in ITU-T Recommendation F.720) should not exceed 400 ms, with the one way delay of the transmission path not exceeding 150 ms	Req	Suppl. F.720, F.723, G.114	YES
3. Speech quality should be maintained during $\leq$3% frame erasures over any 10 second period. The speech quality criterion is a reduction of $\leq$0.5 mean opinion score unit (5 point scale) relative to the error-free condition (G.726 at 32 kbit/s)	Req	G.174, § 7.11 and M.1079 § 7.3.1	YES
4. DTMF signal reliable transport (for PSTN is typically less than one DTMF error signal in 10^4)	Req	G.174, § 7.11 and M.1079 § 7.3.1	YES
5. Voiceband data support including G3 facsimile	Req	M.1079 § 7.2.2,	YES
6. Support packet switched data services as well as circuit switched data; requirements for data performance given in ITU-	Req	M.1034 §§ 10.8,	YES

IMT-2000 Item Description	Obj/Req	Source	Meets
TG.174		10.9	
Radio interfaces and subsystems, network related performance requirements			
7. Network interworking with PSTN and ISDN in accordance with Q.1031 and Q.1032	Req	M.687-1. § 5.4	YES
8. Meet spectral efficiency and radio channel performance requirements of M.1079	Req	M.1034.§ 12.3.3/4	YES
9. Provide phased approach with data rates up to 2 Mbit/s in phase 1	Obj	M.687, § 1.1.14	YES
10.Maintain bearer channel bit-count integrity (e.g. synchronous data services and many encryption techniques)	Obj	M.1034,§ 10.12	YES
11. Support for different cell sizes, for example: Mega cell Radius~100-500 km Macro cell Radius $\leq$35km, Speed $\leq$500 km/h Micro cell Radius $\leq$1km, Speed $\leq$100 km/h Pico cell Radius $\leq$50m, Speed $\leq$10 km/h	Obj	M.1035,§ 10.1	YES
Application of IMT-2000 for fixed services and developing countries			
12. Circuit noise- idle noise levels in 99% of the time about 100pWp	Obj	M.819-1, § 10.3	YES
13. Error performance - as specified in ITU-R F.697	Obj	M.819-1, § 10.4	YES
14. Grade of service better than 1%	Obj	M.819-1, § 10.5	YES

TABLE 2

Generic Requirements and Objectives Relevant to the Evaluation of Candidate Radio Transmission Technologies

IMT-2000 Item Description	Obj/Req	Source	Meets
Radio interfaces and subsystems, network related performance requirements			
1. Security comparable to that of PSTN/ISDN	Obj	M.687-1, § 4.4	YES
2. Support mobility, interactive and distribution services	Req	M.816, § 6	YES
3. Support UPT and maintain common presentation to users	Obj	M.816, § 4	YES
4. Voice quality comparable to the fixed network (applies to both mobile and fixed service)	Req	M819-1, Table 1, M.1079, § 7.1	YES
5. Support encryption and maintain encryption when roaming and during handover	Req	M.1034 § 11.3	YES

IMT-2000 Item Description	Obj/Req	Source	Meets
6. Network access indication similar to PSTN (e.g. dialtone)	Req	M.1034 §§ 11.5	YES
7. Meet safety requirements and legislation	Req	M.1034, § 11.6	YES
8. Meet appropriate EMC regulations	Req	M.1034, § 11.7	YES
9. Support multiple public/private/residential IMT-2000 operators in the same locality	Req	M.1034, § 12.1.2	YES
10. Support multiple mobile station types	Req	M.1034, § 12.1.4	YES
11. Support roaming between IMT-2000 operators and between different IMT-2000 radio interfaces/environments	Req	M.1034, § 12.2.2	YES
12. Support seamless handover between different IMT-2000 environments such that service quality is maintained and signaling is minimized	Req	M.1034, § 12.2.3	YES
13. Simultaneously support multiple cell sizes with flexible base location, support use of repeaters and umbrella cells as well as deployment in low capacity areas	Req	M.1034, § 12.2.5	YES
14. Support multiple operator coexistence in a geographic area	Req	M.1034, § 12.2.5	YES
15. Support different spectrum and flexible band sharing in different countries including flexible spectrum sharing between different IMT-2000 operators (see M.1036)	Req	M.1034, § 12.2.8	YES
16. Support mechanisms for minimizing power and interference between mobile and base stations	Req	M.1034, § 12.2.8.3	YES
17. Support various cell types dependent on environment (M.1035 § 10.1)	Req	M.1034, § 12.2.9	YES
18. High resistance to multipath effects	Req	M.1034, § 12.3.1	YES
19. Support appropriate vehicle speeds (as per § 7) Note: applicable to both terrestrial and satellite proposals	Req	M.1034. § 12.3.2	YES
20. Support possibility of equipment from different vendors	Req	M.1034, § 12.1.3	YES
21. Offer operational reliability at least as good as 2nd generation mobile systems	Req	M.1034, § 12.3.5	YES
22. Ability to use terminal to access services in more than one environment, desirable to access services from one terminal in all environments	Obj	M.1035, § 7.1	YES
23. End-to-end quality during handover comparable to fixed services	Obj	*M.1034-1* § 11.2.3.4	YES
24. Support multiple operator networks in a geographic area without requiring time synchronization	Obj		YES

IMT-2000 Item Description	Obj/Req	Source	Meets
25. Layer 3 contains functions such as call control, mobility management and radio resource management some of which are radio dependent. It is desirable to maintain layer 3 radio transmission independent as far as possible	Obj	M.1035, § 8	YES
26. Desirable that transmission quality requirements from the upper layer to physical layers be common for all services	Obj	M.1035, § 8.1	YES
27. The link access control layer should as far as possible not contain radio transmission dependent functions	Obj	M.1035, § 8.3	YES
28. Traffic channels should offer a functionally equivalent capability to the ISDN B channels	Obj	M.1035, § 9.3.2	YES
29. Continually measure the radio link quality on forward and reverse channels	Obj	M.1035, § 11.1	YES
30. Facilitate the implementation and use of terminal battery saving techniques	Obj	M.1035, § 12.5	YES
31. Accommodate various types of traffic and traffic mixes	Obj	M.1036, § 1.10	YES
Application of IMT-2000 for fixed services and developing countries			
32. Repeaters for covering long distances between terminals and base stations, small rural exchanges with wireless trunks etc.	Req	M.819-1, Table 1	YES
33. Withstand rugged outdoor environment with wide temperature and humidity variations	Req	M.819-1, Table 1	YES
34. Provision of service to fixed users in either rural or urban areas	Obj	M.819-1, § 4.1	YES
35. Coverage for large cells (terrestrial)	Obj	M.819-1, § 7.2	YES
36. Support for higher encoding bit rates for remote areas	Obj	M.819-1, § 10.1	YES
Satellite component (Not required for RTT submission)			
37. Links between the terrestrial and the satellite control elements for handover and exchange of other information	Req	M.818-1, § 3.0	N/A
38. Take account for constraints for sharing frequency bands with other services (WARC-92)	Obj	M.818-1, § 4.0	N/A
39. Compatible multiple access schemes for terrestrial and satellite components	Obj	M.818-1, § 6.0	N/A
40. Service should be comparable quality to terrestrial component as far as possible	Obj	M.818-1, § 10.0	N/A
41. Use of satellites to serve large cells for fixed users	Obj	M.819-2, § 7.1	N/A
42. Key features (e.g. coverage, optimization, number of systems)	Obj	M.1167, § 6.1	N/A

IMT-2000 Item Description	Obj/Req	Source	Meets
43. Radio interface general considerations	Req	M.1167, § 8.1.1	N/A
44. Doppler effects	Req	M.1167, § 8.1.2	N/A

TABLE 3

**Subjective Requirements and Objectives Relevant to the
Evaluation of Candidate Radio Transmission Technologies**

IMT-2000 Item Description	Obj/Req	Source	Meets
1. Fixed Service- Power consumption as low as possible for solar and other sources	Req	M.819-1. Table 1	YES
2. Minimize number of radio interfaces and radio sub-system complexity, maximize commonality (M.1035, § 7.1)	Req	M.1034, § 12.2.1	YES
3. Minimize need for special interworking functions	Req	M.1034, § 12.2.4	YES
4. Minimum of frequency planning and inter-network coordination and simple resource management under time-varying traffic	Req	M.1034, § 12.2.6	YES
5. Support for traffic growth, phased functionality, new services or technology evolution	Req	M.1034, § 12.2.7	YES
6. Facilitate the use of appropriate diversity techniques avoiding significant complexity if possible	Req	M.1034, § 12.2.10	YES
7. Maximize operational flexibility	Req	M.1034, § 12.2.11	YES
8. Designed for acceptable technological risk and minimal impact from faults	Req	M.1034, § 12.2.12	YES
9. When several cell types are available, select the cell that is the most cost and capacity efficient	Obj	M.1034, § 10.3.3	YES
10. Minimize terminal costs, size and power consumption, where appropriate and consistent with other requirements	Obj	M.1036, § 1.12	YES

TABLE 4

Minimum Performance Capabilities

Test environments	Indoor Office	Outdoor to Indoor and Pedestrian	Vehicular
Mobility Considerations	mobility type (low)	mobility type (medium)	mobility type (high)
Handover	Yes	Yes	Yes
Support of general service capabilities			
Packet data	Yes	Yes	Yes
Asymmetric services	Yes	Yes	Yes
Multimedia	Yes	Yes	Yes
Variable bit rate	Yes	Yes	Yes

8.1   Compatibility with the existing IMT-2000 radio interfaces

The proposed updates are backward compatible with the existing IMT-2000 CDMA DS and IMT-2000 CDMA TDD radio interfaces. The key RF parameters are not modified, and all features supported in the existing IMT-2000 CDMA DS and IMT-2000 CDMA TDD are still supported in the proposed update.

8.2   Harmonization within multiple proposals

Harmonization with multiple proposals has been done to the extent possible respecting the compatibility with the existing IMT-2000 radio interface.

"Other Considerations" (Section 9 in 8/LCCE/95)

9.1   Benefits of the proposed enhancement

The proposed enhancements improve the performance of IMT-2000 CDMA DS and IMT-2000 CDMA TDD radio interfaces.

9.2   Harmonization and consensus building

All the radio interface specifications included in the proposed update were unanimously approved in 3GPP by all Organisational Partners (ARIB, CWTS, ETSI, T1, TTA, and TTC). The WP8F activity toward the consensus of ITU members will be facilitated by the evidence that many of the IMT-2000 technology updates and concepts used are actually shared with other standards development organisations.

9.3 Enhanced performance capabilities

The proposed update is fully in line with the ongoing activities on the vision for the enhancements of IMT-2000, also reflected in the Roadmap for the future updates of Rec. ITU-R M.1457.

ANNEX 6

Self-declaration that the proposed amendments are self-consistent between Section 5.1.1, Section 5.1.2, and the GCS, as well as between Section 5.3.1, Section 5.3.2, and the GCS

3GPP TSG RAN concludes that the proposed amendments are self-consistent between Sections 5.1.1, 5.1.2, and the GCS, as well as between Sections 5.3.1, 5.3.2, and the GCS.