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*ITU-D Regional Development Forum for the Asia Pacific Region:
"NGN and Broadband, Opportunities and Challenges"
Yogyakarta, Indonesia, 27-29 July 2009*

IMT-Advanced Standardization Process

*Colin LANGTRY
Counsellor, ITU Radiocommunication Bureau (BR)
E-mail: colin.langtry@itu.int*



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Background

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- For the last 25 years, ITU has been coordinating the development of a global broadband multimedia international mobile telecommunication system, known as IMT.
- Since 2000, the world has seen the introduction of the first family of standards derived from the IMT concept - IMT-2000. There are now more than a billion IMT-2000 (3G) subscribers.
- “IMT-Advanced” provides a global platform on which to build the next generations of mobile services - fast data access, unified messaging and broadband multimedia - in the form of exciting new interactive services.

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What is IMT-Advanced?

IMT-Advanced systems are mobile systems that include new capabilities that go beyond those of IMT-2000. They will:

- provide access to a wide range of telecommunication services including advanced mobile services, supported by mobile and fixed networks, which are increasingly packet-based;
- support low to high mobility applications and a wide range of data rates in accordance with user and service demands in multiple user environments;
- provide for high quality multimedia applications within a wide range of services and platforms, providing a significant improvement in performance and quality of service.

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Key features

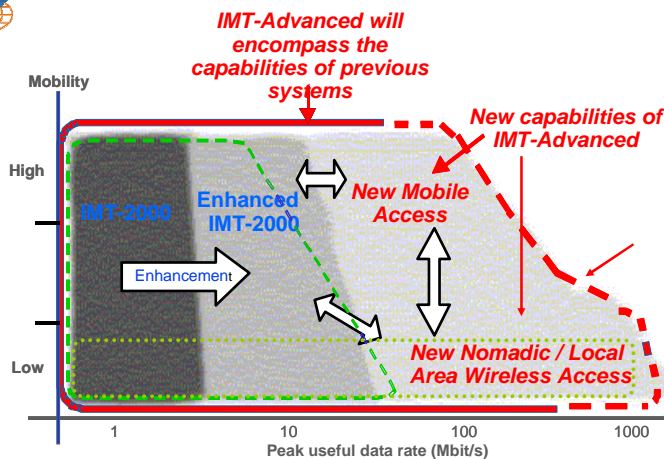
- a high degree of commonality of functionality worldwide while retaining the flexibility to support a wide range of services and applications in a cost efficient manner;
- compatibility of services within IMT and with fixed networks;
- capability of interworking with other radio access systems;
- high quality mobile services;
- user equipment suitable for worldwide use;
- user-friendly applications, services and equipment;
- worldwide roaming capability; and,
- enhanced peak data rates to support advanced services and applications (100 Mbit/s for high and 1 Gbit/s for low mobility were established as targets for research)*.

* See Recommendation ITU-R M.1645

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Capabilities

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↔ Interconnection



Nomadic / Local Area Access Systems



Digital Broadcast Systems

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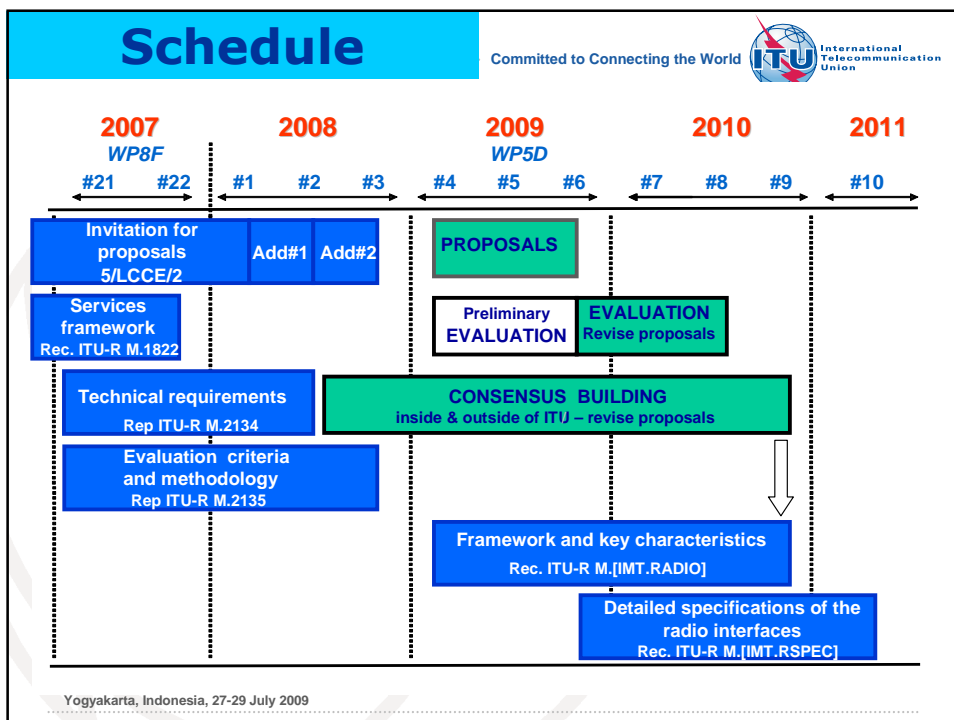
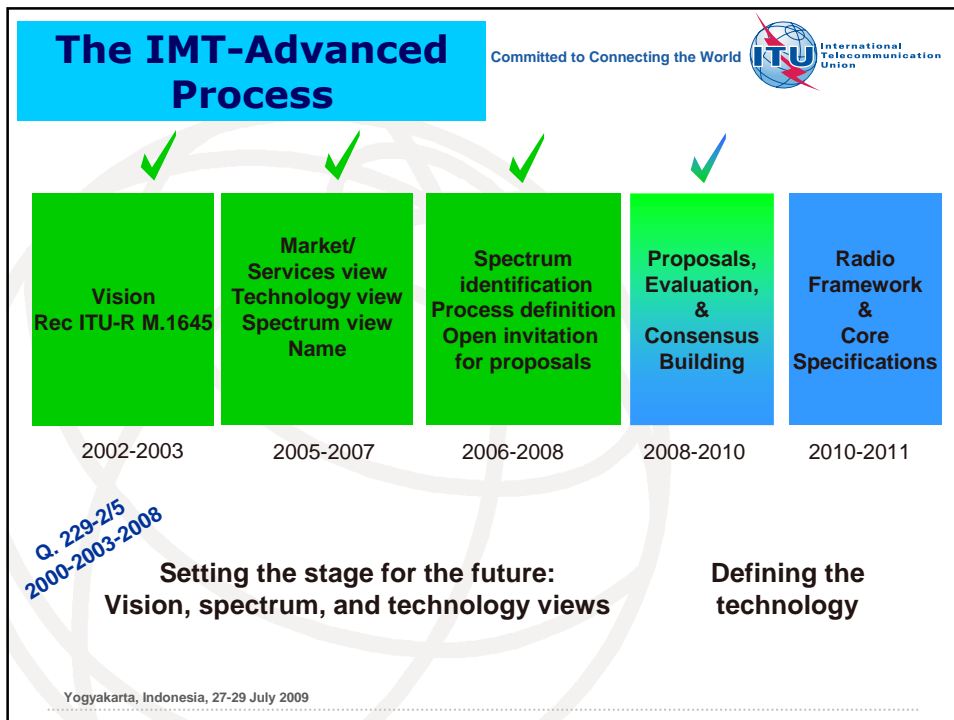
Resolution ITU-R 57

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- ITU-R has commenced the process of developing ITU-R Recommendations for the terrestrial components of the IMT-Advanced radio interface(s). This work is guided by Resolution ITU-R 57, which was approved by the Radiocommunication Assembly in 2007.
- Resolution ITU-R 57 on the “Principles for the process of development of IMT-Advanced” outlines the essential criteria and principles which will be used in the process of developing the Recommendations and Reports for IMT-Advanced, including Recommendation(s) for the radio interface specification.

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Key documents

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Circular Letter 5/LCCE/2 and addenda

7 Mar 2008 & 12 Aug 2008

INVITATION FOR SUBMISSION OF PROPOSALS FOR CANDIDATE RADIO TECHNOLOGIES FOR THE TERRESTRIAL COMPONENT OF IMT-ADVANCED

Doc. IMT-ADV/1

30 May 2008

BACKGROUND ON IMT-ADVANCED

Doc IMT-ADV/2 Rev 1

7 Aug 2008

TIMELINES, SUBMISSION AND EVALUATION PROCESS, AND CONSENSUS BUILDING

REPORT ITU-R M.2133

11 Nov 2008

REQUIREMENTS, EVALUATION CRITERIA, and SUBMISSION TEMPLATES FOR THE DEVELOPMENT OF IMT-ADVANCED

REPORT ITU-R M.2134

11 Nov 2008

REQUIREMENTS RELATED TO TECHNICAL PERFORMANCE FOR IMT-ADVANCED RADIO INTERFACE(S)

REPORT ITU-R M.2135

11 Nov 2008

GUIDELINES FOR EVALUATION OF RADIO INTERFACE TECHNOLOGIES FOR IMT-ADVANCED

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Circular Letter 5/LCCE/2 and addenda

- The purpose of this Circular Letter is to invite the submission of proposals for candidate radio interface technologies (RITs) or a set of RITs (SRITs) for the terrestrial components of IMT-Advanced.
- This Circular Letter also initiates an ongoing process to evaluate the candidate RITs or SRITs for IMT-Advanced, and invites the formation of independent evaluation groups and the subsequent submission of evaluation reports on these candidate RITs or SRITs.

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Evaluation Groups

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- ARIB Evaluation Group
- ATIS WTSC
- Canadian Evaluation Group (CEG)
- Chinese Evaluation Group (ChEG)
- ETSI
- Israeli Evaluation Group (IEG)
- TCOE India
- TR-45
- TTA PG707
- UADE, Instituto de Tecnología (Argentina)
- Wireless Communications Association International (WCAI)
- WINNER+

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<http://www.itu.int/ITU-R/go/rsg5-imt-advanced>

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Radiocommunication Sector (ITU-R) - IMT-Advanced submission and evaluation process - Microsoft Internet Explorer

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IMT-Advanced submission and evaluation process

Introduction

ITU-R has commenced the process of developing ITU-R Recommendations for the terrestrial components of the IMT-Advanced radio interface(s). This work is guided by Resolution ITU-R 57. This web page has been established to facilitate the development of proposals for the terrestrial components of the radio interface(s) for IMT-Advanced and their subsequent evaluation.

Background

- ▶ Background on IMT-Advanced - ([Doc. IMT-ADV/1](#))

Invitation

- ▶ Invitation for submission of proposals for candidate radio interface technologies for the terrestrial components of the radio interface(s) for IMT-Advanced and invitation to participate in their subsequent evaluation - ([Circular Letter 5/LCCE/2](#))
 - Addendum 1 - to [Circular Letter 5/LCCE/2](#)
 - Addendum 2 - to [Circular Letter 5/LCCE/2](#)

Requirements, evaluation criteria and submission templates for the development of IMT-Advanced

Requirements, evaluation criteria and submission templates for the development of IMT-Advanced
Report ITU-R M.2133

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Supplementary information

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References

- **Circular Letter 5/LCCE/2** - Invitation for proposals and evaluation groups
- **Doc. IMT-ADV/1** - Background on IMT-Advanced
- **Doc. IMT-ADV/2 Rev.1** - Submission and evaluation process and consensus building
- **Report ITU-R M.2133** - Requirements, evaluation criteria and submission templates for the development of IMT-Advanced
- **Report ITU-R M.2134** - Requirements related to technical performance for IMT-Advanced radio interface(s)
- **Report ITU-R M.2135** - Guidelines for evaluation of radio interface technologies for IMT-Advanced
- **Spectrum Aspects Documents**
- **Marketplace and User Needs Aspects Documents**
- **Regulatory Aspects Documents**
- **Technology Aspects Documents**

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Circular Letter 5/LCCE/2 and addenda Invitation for proposals and evaluation groups

- The purpose of this Circular Letter is to invite the submission of proposals for candidate radio interface technologies (RITs) or a set of RITs (SRITs) for the terrestrial components of IMT-Advanced.
- This Circular Letter also initiates an ongoing process to evaluate the candidate RITs or SRITs for IMT-Advanced, and invites the formation of independent evaluation groups and the subsequent submission of evaluation reports on these candidate RITs or SRITs.

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DOCUMENT IMT-ADV/1 Background on IMT-Advanced

- This document provides summary and background information on IMT-Advanced.
- International Mobile Telecommunications-Advanced (IMT-Advanced) systems are mobile systems that include the new capabilities of IMT that go beyond those of IMT-2000. Such systems provide access to a wide range of telecommunication services including advanced mobile services, supported by mobile and fixed networks, which are increasingly packet-based.
- IMT-Advanced systems support low to high mobility applications and a wide range of data rates in accordance with user and service demands in multiple user environments. IMT-Advanced also has capabilities for high quality multimedia applications within a wide range of services and platforms, providing a significant improvement in performance and quality of service.

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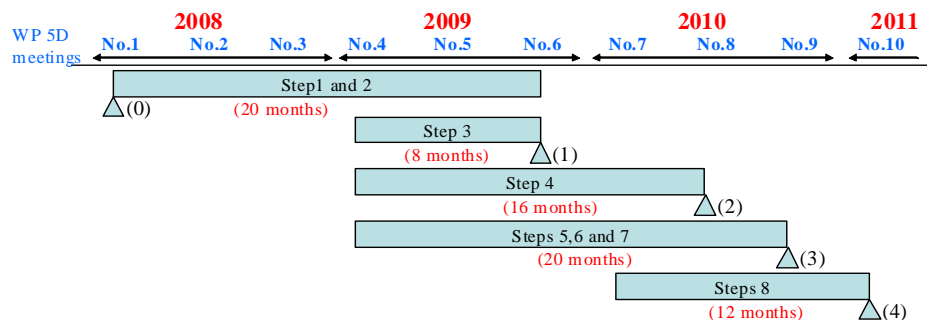
DOCUMENT IMT-ADV/2 Rev 1

Submission and evaluation process and consensus building

- This document describes the process and activities identified for the development of the IMT-Advanced terrestrial components radio interface Recommendations:
- **1 Time schedule**
- The time schedule described below applies to the first invitation for candidate RITs or SRITs. Subsequent time schedules will be decided according to the submissions of proposals.
- Submission of proposals may begin at any time subsequent to the release of Circular Letter 5/LCCE/2, dated 7 March 2008. The final deadline for submissions is 16:00 hours UTC, 7 calendar days prior to the start of the 6th meeting of Working Party 5D (WP 5D) in the latter part of 2009. The evaluation of the proposed radio interface technologies by the evaluation groups and the consensus-building process will be performed throughout this time period and thereafter. The detailed schedule can be found in Figure A2-1.

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FIGURE A2-1
Schedule for the development of IMT-Advanced radio interface Recommendations



Steps in radio interface development process:

- | | |
|--|--|
| Step 1: Issuance of the circular letter | Step 5: Review and coordination of outside evaluation activities |
| Step 2: Development of candidate RITs and SRITs | Step 6: Review to assess compliance with minimum requirements |
| Step 3: Submission/Reception of the RIT and SRIT proposals and acknowledgment of receipt | Step 7: Consideration of evaluation results, consensus building and decision |
| Step 4: Evaluation of candidate RITs and SRITs by evaluation groups | Step 8: Development of radio interface Recommendation(s) |

Critical milestones in radio interface development process:

- | | | | |
|--|--------------|---|---------------|
| (0): Issue an invitation to propose RITs | March 2008 | (2): Cut off for evaluation report to ITU | June 2010 |
| (1): ITU proposed cut off for submission of candidate RIT and SRIT proposals | October 2009 | (3): WP 5D decides framework and key characteristics of IMT-Advanced RITs and SRITs | October 2010 |
| | | (4): WP 5D completes development of radio interface specification Recommendations | February 2011 |

IMT-Advanced A2-01

REPORT ITU-R M.2133

Requirements, evaluation criteria and submission templates for the development of IMT-Advanced

- This Report supports the process for IMT-Advanced initiated by Circular Letter 5/LCCE/2 and its' Addenda. It addresses the requirements, evaluation criteria, as well as submission templates required for a *complete submission* of candidate radio interface technologies (RITs) and candidate sets of radio interface technologies (SRITs) for IMT-Advanced.
- It provides:
 - 1) The service, spectrum and technical performance requirements for candidate RITs/SRITs for IMT-Advanced.
 - 2) Evaluation guidelines including evaluation criteria and procedures to evaluate technology submissions for IMT-Advanced.
 - 3) Submission templates that proponents must utilize to organize the information that is required in a submission of a candidate technology for evaluation. Proponents must provide the required information.

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Report ITU-R M.2133 - contents

- **IMT-ADVANCED REQUIREMENTS**
 - Services
 - Spectrum
 - Technical Performance → **Report ITU-R M.2134**
- **IMT-ADVANCED EVALUATION**
 - Guidelines, evaluation criteria → **Report ITU-R M.2135**
 - Required number of test environments
- **IMT-ADVANCED SUBMISSION GUIDELINES & TEMPLATES**
 - Completeness of Submissions
 - Submission Guidelines and Templates
 - Submission Guidelines
 - Templates for Submission
 - RIT/SRIT description template
 - RIT/SRIT compliance templates

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Report ITU-R M.2134

Requirements related to technical performance for IMT-Advanced radio interface(s)

- This Report describes requirements related to technical performance for IMT-Advanced candidate radio interfaces. These requirements were used in the development of Report ITU-R M.2135 – “Guidelines for evaluation of radio interface technologies for IMT-Advanced”.
- It also provides the necessary background information about the individual requirements and the justification for the items and values chosen. This information is needed for a broader understanding of the requirements.
- It is based on the ongoing development activities from external research and technology organizations.

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Report ITU-R M.2135

Guidelines for evaluation of radio interface technologies for IMT-Advanced

- This Report provides guidelines for both the procedure and the criteria (technical, spectrum and service) to be used in evaluating the proposed IMT-Advanced radio interface technologies (RITs) or Sets of RITs (SRITs) for a number of test environments and deployment scenarios for evaluation. These test environments are chosen to simulate closely the more stringent radio operating environments. The evaluation procedure is designed in such a way that the overall performance of the candidate RIT/SRITs may be fairly and equally assessed on a technical basis. It ensures that the overall IMT-Advanced objectives are met.
- It provides, for proponents, developers of candidate RIT/SRITs and evaluation groups, the common methodology and evaluation configurations to evaluate the proposed candidate RIT/SRITs and system aspects impacting the radio performance.
- It allows a degree of freedom so as to encompass new technologies. The actual selection of the candidate RIT/SRITs for IMT-Advanced is outside the scope of this Report.
- The candidate RIT/SRITs will be assessed based on these evaluation guidelines. If necessary, additional evaluation methodologies may be developed by each independent evaluation group to complement the evaluation guidelines. Any such additional methodology should be shared between evaluation groups and sent to the Radiocommunication Bureau as information in the consideration of the evaluation results by ITU-R and for posting under additional information relevant to the evaluation group section of the ITU-R IMT-Advanced web page (<http://www.itu.int/ITU-R/go/rsg5-imt-advanced>).

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Spectrum Aspects Documents

- **Recommendation ITU-R M.1768** - *Methodology for calculation of spectrum requirements for the future development of the terrestrial component of IMT-2000 and systems beyond IMT-2000*
(completed 2006 ITU-R deliverable)
- **Report ITU-R M.2078** - *Estimated spectrum bandwidth requirements for the future development of IMT-2000 and IMT-Advanced*
(completed 2006 ITU-R deliverable)
- **Report ITU-R M.2079** - *Technical and operational information for identifying Spectrum for the terrestrial component of future development of IMT-2000 and IMT-Advanced*
(completed 2006 ITU-R deliverable)

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Marketplace and User Needs Aspects Documents

- **Recommendation ITU-R M.1645** - *Framework and overall objectives of the future development of IMT-2000 and systems beyond IMT-2000*
(completed 2002/2003 ITU-R deliverable)
- **Report ITU-R M.2072** - *World mobile telecommunication market forecast*
(completed 2005 ITU-R deliverable)
- **Recommendation ITU-R M.1822** - *Framework for Services delivered by IMT*
(completed 2007 ITU-R deliverable)

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Regulatory Aspects Documents

- **Recommendation ITU-R M.1036** - *Frequency arrangements for implementation of the terrestrial component of International Mobile Telecommunications-2000 (IMT 2000) in the bands 806-960 MHz, 1 710-2 025 MHz, 2 110-2 200 MHz and 2 500-2 690 MHz*
(completed 1994-1999-2003-2007 ITU-R deliverable – update currently in progress)
- **Resolution ITU-R 56** - *Naming for International Mobile Telecommunications*
(completed 2005 ITU-R deliverable)
- **Reports ITU-R M.2109, M.2110, M.2111, & M.2112** - *(IMT related sharing studies covering various bands and technologies)*
(completed 2005 ITU-R deliverable)

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Technology Aspects Documents

- **Resolution ITU-R 57** - *Principles for the process of development of IMT-Advanced (Question ITU-R 229/8)*
(completed 2006 ITU-R deliverable)
- **Report ITU-R M.2038** - *Technology Trends*
(completed 2005 ITU-R deliverable)
- **Report ITU-R M.2074** - *Radio aspects for the terrestrial component of IMT-2000 and systems beyond IMT-2000*
(completed 2005 ITU-R deliverable)
- **Report ITU-R M.2133** - *Requirements, evaluation criteria, and submission templates for the development of IMT-Advanced*
(completed 2008 ITU-R deliverable)
- **Report ITU-R M.2134** - *Requirements related to technical system performance for IMT-Advanced Radio interface(s)*
(completed 2008 ITU-R deliverable)
- **Report ITU-R M.2135** - *Guidelines for evaluation of radio interface technologies for IMT-Advanced*
(completed 2008 ITU-R deliverable)

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Thank you!