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Decision	
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INTERNATIONAL TELECOMMUNICATION UNION

RADIOCOMMUNICATION STUDY GROUPS

Revision 1 to Document 8F/TEMP/17-E 24 August 2000

2nd Meeting of Working Party 8F
21 - 25 August 2000, San Diego, USA

Working Party 8F

LIAISON STATEMENT TO SDOS, 3GPP AND 3GPP2

ON HANDLING OF MEASURMENT UNCERTAINTY FOR THE TERRESTRIAL COMPONENT OF IMT-2000

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During the second meeting of WP 8F, the attached working document toward a PDNR was prepared to consider handling of measurement uncertainty. The purpose for this document is to give technical information in order to reach global consensus about how to handle measurement uncertainty.

To consider the issue of how to handle measurement uncertainty, advice from your organisation will be helpful for the next meeting of WP 8F on 23-27 October 2000. We would appreciate any advice or information related to the issue.

For your information, contributions from Japan (Doc. 8F/29) and Motorola and Nokia (Doc. 8F/41) are also attached to provide technical background of measurement uncertainty.

Attachment: [Doc. 8F/TEMP/33] (in separate file) (not included)

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Document 8F/TEMP/33-E
24 August 2000

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Working Party 8F
(DG1 CIRC)

WORKING DOCUMENT TOWARD PRELIMINARY DRAFT NEW RECOMMENDATION

HANDLING OF MEASUREMENT UNCERTAINTY FOR [THE TERRESTRIAL COMPONENT OF] IMT-2000

1. Introduction

It has been seen that there are substantial differences as to how measurement uncertainty is understood and handled by the regulatory organisations in each region. This will prevent global circulation of IMT-2000 equipment, particularly the user equipment (UE), though they are defined as key features of IMT-2000 by Recommendation ITU-R M.1457, DETAILED SPECIFICATIONS OF THE RADIO INTERFACE OF IMT-2000. In order to solve this problem, it is essentially important to achieve a common global understanding for how to handle measurement uncertainty.

2. Scope

This draft new Recommendation identifies how measurement uncertainty in the IMT-2000 [terrestrial component] should be handled, based on the practical understanding and treatment on the issue put in place by each region.

3. Related Recommendation

The existing IMT-2000 Recommendation that is considered to be relevant to the development of this particular Recommendation is as follows;

ITU-R M.1457 - DETAILED SPECIFICATIONS OF THE RADIO INTERFACE OF IMT-2000.

4. Definitions

core specification value: Value defined in the core specification

test limit: Threshold considered in a test to assess compliance of the device; it might also be relaxed or tightened compared to the corresponding core specification value

'Never fail a good DUT (Device Under Test)' principle: Measurement results are compared with test limits tolerating failures up to the measurement uncertainty (i.e., the DUT is considered to pass if the measurement result is within the test limits + tolerance up to measurement uncertainties).

'Shared Risk' principle: Measurement results are compared with test limits (i.e., the DUT is considered to pass if the measurement result is within the test limits).

5. Consideration

It is reasonable to allow in practice some measurement uncertainty in the measurement method, measurement equipment and measurement test bench when apparatus is to be tested from a regulatory viewpoint. However, measurement uncertainty is handled differently depending on regional regulations, which give rises to problems in global circulation of user equipment (UE), the essential features of the IMT-2000. Apparatus that is manufactured in a country and passes conformance test based on regulation of this country may not be well accepted by the regulator of another country, not due to actual inadequacy of the equipment but because of difference in the concepts employed for handling measurement uncertainty. This issue is deemed important, since this may pose impacts not only on the requirement for conformance test but also on the system performance of IMT-2000. Therefore, handling of measurement uncertainty in conjunction with how that is incorporated into pertinent specifications needs to be globally well understood, and this recommendation aims at facilitating an appropriate legislation process in each region.

From a technical perspective, in case the measurement uncertainty can be reasonably defined, the following three methods lead to the same result (see Annex 1):

?? "Never fail a good DUT" principle applied to a test limit equals to the core specification value, where core specification value and measurement uncertainty are separately defined

?? "Shared risk" principle applied to a test limit calculated by relaxing the core specification value by measurement uncertainty, where core specification value and measurement uncertainty are separately defined

?? "Shared risk" principle applied to a test limit which equals to the core specification value that includes measurement uncertainty

6. Recommendation

The ITU Radiocommunication Assembly recommends that the followings should be adopted

1 Maximum allowable measurement uncertainty should be defined as a unique and consistent value associated with one or a combination of measurement methods and measurement equipment to be used in measurement test bench to the largest extent that current technology allows, when apparatus for IMT-2000 [terrestrial component] is to be tested for conformance.

2 In order to be consistent with industry practise, the shared risk principle should be used for all tests. In some cases, it may be decided to relax the core specification value by an amount up to the entire Test System measurement uncertainty (not just the test equipment uncertainty); this relaxation value has to be evaluated taking into account the system behaviour, in order to avoid system performance degradation.

3 It should be clearly indicated where the relaxation value is specified.

4 In case that the measurement uncertainty can not be reasonably and clearly defined, "Shared risk" principle should be applied to core specification value without any relaxation.

ANNEX 1[1]

Examples of two criteria using "Never fail a good DUT" and "Shared Risk" principles

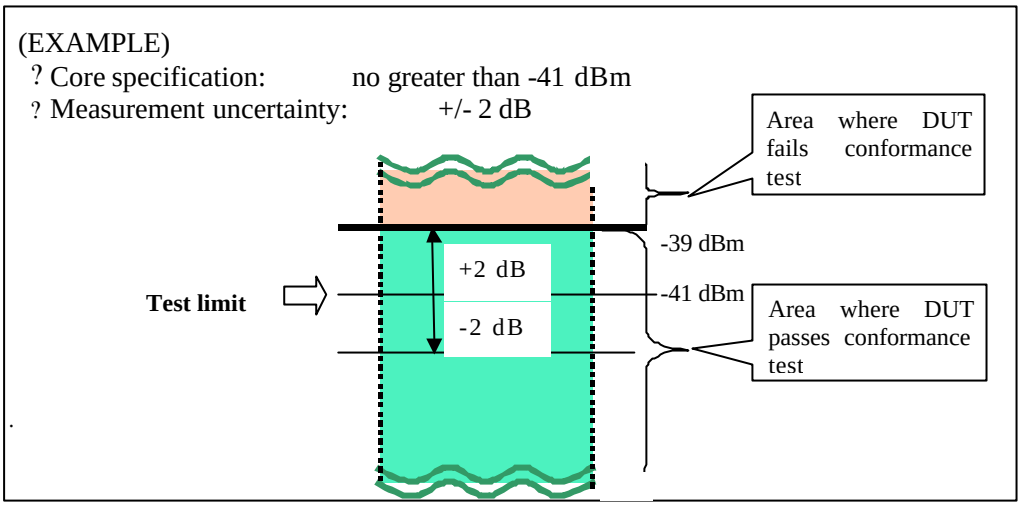

FIGURE 1

"Never fail a good DUT" principle where core specification value and measurement uncertainty are separately defined

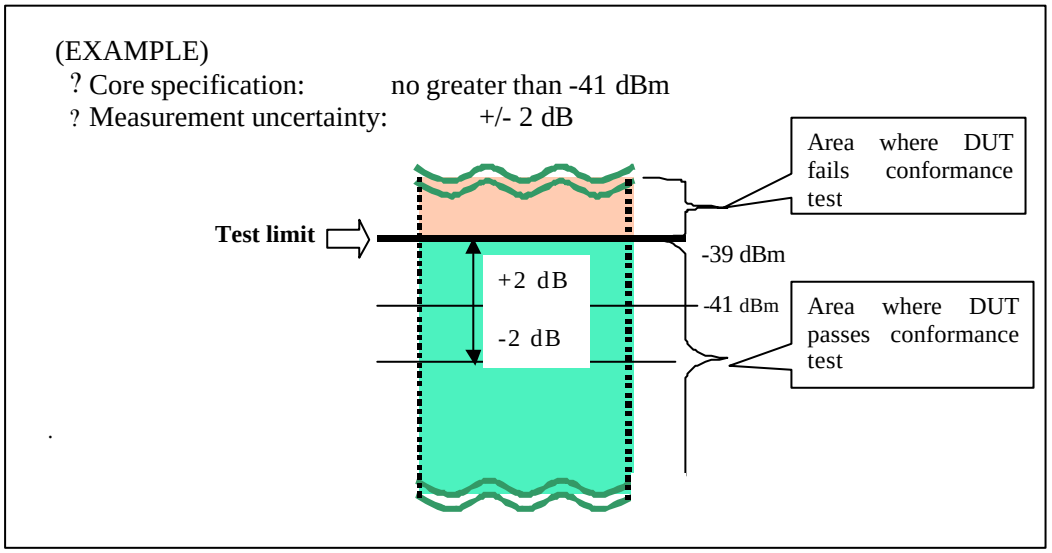

FIGURE 2

Application of "shared risk" principle where test limit is calculated by relaxing the core specification value by measurement uncertainty (when core specification value and measurement uncertainty are separately defined)

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1 The confidence level is not considered in this Recommendation.

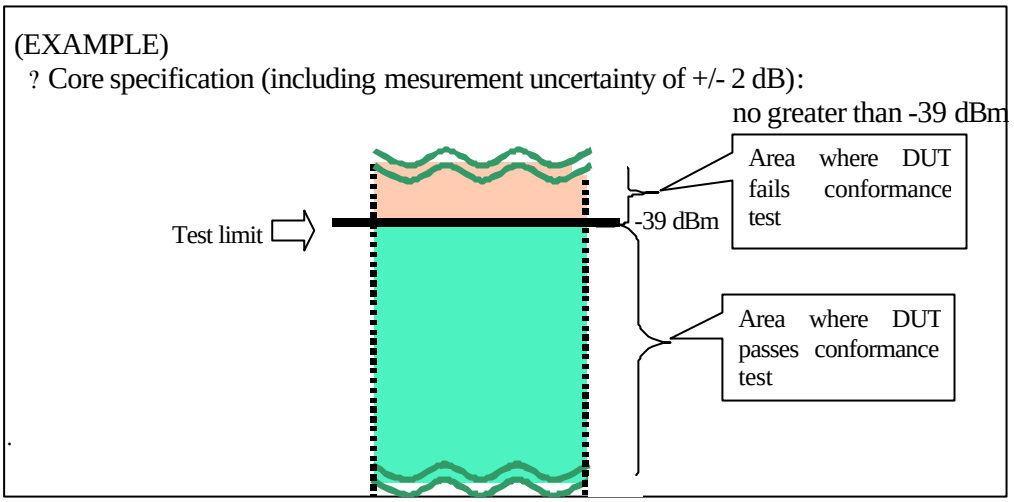

FIGURE 3

Application of "Shared Risk" principle where the test limit is the core specification value that includes measurement uncertainty