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English only**

## **Working Party 5D**

### **LIAISON STATEMENT TO INDEPENDENT EVALUATION GROUPS (COPY TO IMT-ADVANCED TECHNOLOGY PROPONENTS) FOR EVALUATION OF CANDIDATE IMT-ADVANCED TECHNOLOGY SUBMISSIONS**

#### **Background**

As part of the on-going process for IMT-Advanced, the period from October 2009 (the 6<sup>th</sup> meeting of WP 5D) to June 2010 (the 8<sup>th</sup> meeting of WP 5D) has been designated for evaluation of the IMTAdvanced candidate technology submissions by Independent Evaluation Groups.

WP 5D received thirteen contributions for preliminary/interim evaluation reports and a status report from eleven Independent Evaluation Groups at its February 2010 meeting. The evaluation reports are found in the following contributions, [5D/650](#) (ChEG), [5D/651](#) (WFEG), [5D/652](#) (TTA PG707), [5D/653](#) (TTA PG707), [5D/657](#) (TCOE India), [5D/661](#) (WINNER+), [5D/662](#) (REG), [5D/667](#) (WCAI Evaluation Group), [5D/668](#) (CEG), [5D/669](#) (TR-45), [5D/670](#) (ATIS WTSC Evaluation Group), and [5D/671](#) (ATIS WTSC Evaluation Group). The status report is found in 5D/628 (ARIB EG).

WP 5D thanks all the Independent Evaluation Groups for providing preliminary/interim evaluation reports on the candidate IMT-Advanced technologies and the status report, and sees the preliminary reports as good basis for the final evaluation reports to be provided in June 2010. WP 5D also appreciates the relevant activities (workshop and coordination meeting) already held and those planned by the technology proponents, which facilitates the better understanding of the technology proposals by the Independent Evaluation Groups.

This liaison provides comments and feedback on the preliminary evaluation reports, information from the Independent Evaluation Groups, the deadline of the final evaluation report, and the Correspondence Group activity.

## **5D comments and feedback on the preliminary/interim evaluation reports**

### 1) General comments

WP 5D received twelve preliminary/interim evaluation reports from the Independent Evaluation Groups at its 7<sup>th</sup> meeting. WP 5D highly appreciates the participations and contributions of the Evaluation Groups on evaluation of the candidate IMT-Advanced RIT or SRITs.

After review of the received evaluation reports, WP 5D was able to achieve agreements on some important issues, including:

- ◆ Report ITU-R M.2135-1 includes the evaluation criteria currently in force for evaluating candidate IMT-Advanced RIT or SRITs, which shall be followed by every Independent Evaluation Group in evaluation. It was identified that the evaluation results provided to the 7<sup>th</sup> meeting of WP 5D by most Independent Evaluation Groups in their evaluation reports have followed the evaluation criteria as in Report ITU-R M.2135-1. WP 5D encourages all Independent Evaluation Groups to follow the evaluation criteria currently in force when evaluating the candidate RIT or SRITs and preparing final evaluation reports.
- ◆ It was identified that the evaluation reports provided by some Independent Evaluation Groups did not include the compliance templates. It is important for every Independent Evaluation Group to note that the compliance templates (in Report ITU-R M.2133 Section 4.2.4) should be used and provided in the final evaluation reports to record the evaluation results and conclusions of the evaluation groups. Additional detailed information may be added to the templates directly, or provided in another part of the evaluation reports.
- ◆ When preparing final evaluation reports, the Independent Evaluation Groups are suggested to use the evaluation report framework and baseline which was suggested by WP 5D. It can be found in the Liaison Statement to all the Independent Evaluation Groups sent by email on November 12, 2009. The Section F) of Part II) of the suggested framework is not needed.
- ◆ An inconsistency was identified in the superseded Report ITU-R M.2135 Section 7 on overhead to be used in peak spectral efficiency calculation. WP 5D clarifies that Layer 2 overhead should not be included in calculation of peak spectral efficiency. Detailed information is given in a following part. This inconsistency has been resolved in Report ITU-R M.2135-1.

### 2) Clarification on calculation of peak spectral efficiency

According to the definition of the peak spectral efficiency requirement in Section 4.2 of Report ITU-R M.2134,

*The peak spectral efficiency is the highest theoretical data rate (normalised by bandwidth), which is the received data bits assuming error-free conditions assignable to a single mobile station, when all available radio resources for the corresponding link direction are utilised (i.e., excluding radio resources that are used for physical layer synchronisation, reference signals or pilots, guard bands and guard times).*

It is obvious that the peak spectral efficiency is a physical layer rate that only takes physical layer overhead (alternatively known as Layer 1 overhead) into account. The Layer 1 overhead is enumerated in the quoted text from Report ITU-R M.2134.

The error-free conditions must be interpreted as using channel coding with unity rate. The Layer 1 overhead only includes static overhead which are radio resources that are constantly used by the system for proper operation. This static overhead is defined as the radio resources used for physical layer synchronization, reference signals or pilots, guard bands and guard times. This definition was agreed by WP 5D and is expected to be followed by the Independent Evaluation Groups.

However, the following statement in Section 7 of Report ITU-R M.2135 provides a conflicting definition of the overhead in peak spectral efficiency calculation:

*Evaluation of cell spectral efficiency, peak spectral efficiency, cell edge user spectral efficiency and VoIP capacity of candidate RIT/SRITs should take into account the Layer 1 and Layer 2 overhead information provided by the proponents, which may vary when evaluating different performance metrics and deployment scenarios.*

It is understood that there is an inconsistency due to a typo between Report ITU-R M.2135, where it requires inclusion of Layer 1/Layer 2 overhead in calculation of peak spectral efficiency, and Report ITU-R M.2134, where it requires inclusion of Layer 1 overhead. It must be noted that “peak spectral efficiency” is only theoretically calculated whereas “spectral efficiency, cell edge user spectral efficiency and VoIP capacity” require system-level simulations; therefore, the former is different from the latter in terms of evaluation. This inconsistency is already resolved in report ITU-R M.2135 revision 1. (*Report ITU-R M.2135-1 is the Revision 1 of Report M.2135 and includes the amendments in document ITU-R IMT-ADV/3. Report M.2135-1 contains the evaluation criteria currently in force for evaluating candidate IMTAdvanced RIT or SRITs, which shall be followed by every Independent Evaluation Group in evaluation.*)

WP 5D recommends that the definition of the peak spectral efficiency as stated in section 4.2 of Report ITU-R M.2134 be used for the calculation of the peak spectral efficiency by all Independent Evaluation Groups.

### **Information provided by the Independent Evaluation Groups**

WP 5D received information on a use case for evaluation and an antenna pattern at its 7<sup>th</sup> meeting.

- ◆ TCOE India provided a use case of interest to India among others. TCOE India wishes to study the performance in an open rural deployment with nomadic users. Further study is necessary on appropriate channel model for this use case. It is encouraged for the evaluation groups to consider this issue and to provide any feedback to Forum 3 of the Correspondence Group where a new topic will be initiated to address this. (see Document [5D/657](#))
- ◆ 90 degree antenna pattern is proposed by members in Chinese Evaluation Group as an additional evaluation method under Step 4 of the IMT-Advanced development process. It is provided for information. (see Document [5D/645](#))

### **Important timeframe and deadline**

Independent Evaluation Groups are requested to provide the final evaluation report as scheduled for the *June* meeting of WP 5D to Mr. Colin Langtry, Counsellor for Study Group 5 by the ITU-R deadline for input to the June meeting which has been established as 16:00 hours UTC on 2 June 2010.

Working Party 5D thanks the Independent Evaluation Groups for their continuous efforts towards the success of IMT-Advanced and looks forward to receiving your final views in June 2010.

## **Correspondence Group**

WP 5D encourages interactions between the proponents and the Independent Evaluation Groups. As a tool to augment communication, WP 5D has established the Correspondence Group with three Forums. The terms of reference for and information on participation in the Correspondence Group may be found at <http://groups.itu.int/Default.aspx?alias=groups.itu.int/rsg5-forum>.

It should be noted that the Correspondence Group will be closed 16:00 hours UTC on 26 May 2010, but will remain available for reference purposes. Any questions arising after that date should be addressed directly to WP 5D. If an Independent Evaluation Group participant is not able to access the Correspondence Group or any associated documentation, please request necessary arrangements from the contact.

## **Contacts:**

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