**3GPP TSG-RAN WG4 Meeting #104-e R4-2214443**

**Electronic Meeting, August 15th – 26th, 2022**

**Title:** WF on UE RF requirements for 5G broadcast

**Agenda Item:** 12.4.5

**Source: SWR/EBU**

**Document for:** Approval

# Topic#3 UE RF requirements for 5G broadcast

## Core requirement verification <Sub-topic 3-1>

It was clear to companies that for the new downlink only band type, the traditional method to verify receiver requirements is not possible due to lack of an uplink channel for ACK/NAK feedback. It was proposed that existing performance requirements could be used, but companies expressed the need for further study

**<Way forward/Agreement>**: Open issue needs further discussion

1. Option 1:
2. Study/Identify existing indirect performance tests like BLER.
3. If possible/necessary adapt existing performance tests accordingly.
4. If it turns out as infeasible/insufficient start the development of alternative performance tests relying on downlink only.
5. Option 2: Develop alternative performance tests relying on downlink only.
6. Option 3: other

## ACS and blocker placement <Sub-topic 3-2>

There was no agreement on ACS and blocker placement. However, it was commented by one company that it is first necessary to understand the blocking performance needed in a HPHT scenario via coexistence study. The moderator interprets this comment to be more relevant to the magnitude of the ACS and blocking specification rather than the offset of the ACS and blocker, but offset will still have an impact. It may be beneficial to understand the existing ACS and blocking requirements for a DTT receiver, if available

Initial collection of relevant documents:

*[1] TS 36.104*

*[2] In ITU Region 1 operation of transmitters of the broadcasting service are governed by the Technical Annexes of the GE06 Agreement and ETSI specification ETSI EN 302 296.* [*https://www.itu.int/pub/R-ACT-RRC.14-2006/en*](https://www.itu.int/pub/R-ACT-RRC.14-2006/en)[*https://www.etsi.org/deliver/etsi\_en/302200\_302299/302296/02.02.00\_20/en\_302296v020200a.pdf*](https://www.etsi.org/deliver/etsi_en/302200_302299/302296/02.02.00_20/en_302296v020200a.pdf)

*[3] In ITU Region 2, the relevant documents are offered by corresponding national regulators such as FCC in the US and Anatel in Brazil. Title 47 CFR 73.622, Digital television table of allotments, FCC, United States; ABNT 15601, NORMA BRASILEÑA, Televisión digital terrestre — Sistema de transmisión ISDB-Tb, Anatel, Brazil*

*[4] In ITU Region 3, national regulation is applied in coordination and negotiation between affected administrations, such as China. GB20600-2006 [8], Framing structure, channel coding and modulation for digital television terrestrial broadcasting system, National Radio and Television Standardization Technical Committee, People’s Republic of China*

*[5] ITU-R BT.2033 Planning criteria, including protection ratios, for second generation of digital terrestrial television broadcasting systems in the VHF/UHF bands*

*[6] ITU-R BT.2215-7 Measurements of protection ratios and overload thresholds for broadcast TV receivers*

Details of “coordination”:

According to NOTE 2 in the WID [RP-211145] “LTE\_terr\_bcast\_bands\_part2, RAN#92” RAN4 shall assume that coexistence among different systems in the portion of the UHF bandwidth allocated to broadcast (~470 - ~694/698 MHz) is ensured through coordination, in line with regional and national regulation.

Broadcast coordination procedures assure the coexistence of different systems across borders. If a modification of an agreed broadcast plan is intended, e.g. the GE06 Plan, and if this modification exceeds the agreed trigger field strength, then a coordination of the involved parties is required. On the other hand, if the different involved systems already provide the status “coordinated” for a certain plan entry, then the mutual coexistence of other systems being in line with these regional and national regulations is given. For example, the GE06 Agreement [2] allows any system to be operated under the “envelope concept”, i.e. any new system is in regulatory conformity when at every calculation point the interference of a digital plan entry implementation does not exceed the interference envelope derived from the characteristics of the agreed digital plan entry. In other words, no further coordination is needed if the interference contour of a future 5G Broadcast implementation does not exceed the interference contour of an agreed plan entry. The coordination procedure is described in detail in Article 4 of the GE06 Agreement [p.7 ff.].

**<Way forward/Agreement>**: Open issue needs further discussion

1. Option 1:

Collect the associated requirements currently imposed on DTT receiving equipment (e.g. BS ACLR/ UE ACS, blocking requirements and UE performance in general) and include the outcome from thread #128 sub-topic 1-1 “coexistence”. Study performance of existing 3GPP cellular receivers in presence of 6/7/8MHz broadcast bands. It is assumed that the UE has a 10 MHz filter. Develop possible solutions for identified, unresolved technical issues.

1. Option 2: other

## Reference sensitivity <Sub-topic 3-3>

Companies overwhelmingly requested further study as band definition and filtering requirements are unknown.

**<Way forward/Agreement>**: Open issue needs further discussion

1. Option 1: Collect the associated Reference Sensitivity (REFSENS) requirements currently imposed on DTT receiving equipment. Study performance of existing 3GPP cellular receivers in presence of 6/7/8MHz broadcast bands by using LTE band [71] reference sensitivity as a starting point. Take into account possible REFSENS improvements in APT600 band [105]. Develop possible solutions for identified, unresolved technical issues.
2. Option 2: other