3GPP RAN WG4 Meeting #104bis-e R4-22xxxxx

Online, October 10th – 19th, 2022

Title: WF on FR1 2UL inter-band CA coexistence requirements

Agenda item: 6.3.4

Source: Apple

Document for: Approval

# 1 Background

* Along the line of the Rel-18 SI to study on the simplification of band combination specifications for NR and LTE [1], in last RAN4 meeting, it has been proposed that the 2UL inter-band CA UE coexistence requirements is specified only with a normative text [2] which had led to a WF to encourage companies to investigate whether the 2UL inter-band CA UE co-existence requirements can be specified based on the intersection set of the protected bands and frequency ranges from each constituent band without an explicit coexistence table [3].

* In this meeting, several aspects on both single-band and inter-band UL CA coexistence requirements which may lead to the simplification on specifications structure were discussed, including PHS system protection, non-3GGP RATs protection, and potential exceptions or errors from the intersection set of the 2UL constituent bands coexistence requirements were discussed [4-6].
* For PHS system protection, the following conclusions have been drawn:
	+ PHS is still in operation in Japan. It will be retained in UE coexistence requirements till further notice.
	+ PHS and B39 may be protected by the same band in different regions/countries. Despite PHS protection can be covered by B39 from compliance test point of view, both bands will be kept listed for the clarify of coexistence requirements, similar to n77 and n78.
* For non-3GPP RATs protection, the following conclusions have been drawn:
	+ The non-3GPP RATs protection will be retained in UE coexistence requirements.
	+ Whether the non-3GPP RATs protection in 2UL inter-band CA would follow the intersection set rule or be considered as exceptions will be further discussed.
* For 2UL inter-band CA coexistence requirements, the following examples for potential exceptions or errors have been observed:
	+ n104 is protected by both n1 and n3, but not protected by UL CA\_n1-n3.
	+ B22 is protected by n1, not by n5, but it is also protected by UL CA\_n1-n5
* Clarifications on the protected bands not following the intersection set rule as being exceptions or errors are essential to the 2UL inter-band UL CA coexistence specifications structure simplification process.

# Way forward discussions

## 2.1 Way forward

Companies are encouraged to

* Investigate whether the non-3GPP RATs protection can follow the intersection set rule or should be considered as exceptions for FR1 2UL inter-band CA coexistence requirements.
* Identify the cases where the protected bands do not follow the intersection set rule for FR1 2UL inter-band CA coexistence requirements in the current specifications and determine whether they are exceptions or errors.
* Consider the following specifications structure simplification options based on the above investigations for FR1 2UL inter-band CA coexistence requirements:
	+ **Option 1**: If no exceptions identified, replace the current coexistence requirements table with a normative text “For inter-band carrier aggregation with uplink assigned to two NR bands, the requirements are the intersection set from each constituent band coexistence requirements as specified in Table 6.5.3.2-1.” The wordings of the text can be further discussed.
	+ **Option 2**: If exceptions are identified, replace the current coexistence requirements table with a normative text and an exceptions table “For inter-band carrier aggregation with uplink assigned to two NR bands, the requirements are the intersection set from each constituent band coexistence requirements as specified in Table 6.5.3.2-1 with the following exceptions:”

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| NR CA Combination | Protected Band | Frequency Range (MHz) | Maximum Level (dBm) | MBW (MHz) | Protected | NOTE |
| CA\_nA-nB | E-UTRA Band X | FDL\_low | - | FDL\_high | -50 | 1 | Yes |  |
| NR Band nY | FDL\_low | - | FDL\_high | -50 | 1 | No |  |
| CA\_nC-nD |  | aaa |  | bbb | c | d | Yes |  |

## 2.2 Company comments

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| **Company** | **Comments** |
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# 3 References

1. RP-221790 “Revised SID: Study on simplification of band combination specification for NR and LTE”, ZTE Corporation *et al*, 3GPP TSG-RAN Meeting #96, Budapest, Hungary, June 6th – 9th, 2022
2. R4-2212357 “On FR1 2UL inter-band CA coexistence requirements”, Apple, 3GPP TSG-RAN WG4 Meeting #104-e, August 15th – 26th, 2022
3. R4-2214448 “WF on FR1 2UL inter-band CA coexistence requirements”, Apple, 3GPP TSG-RAN WG4 Meeting #104-e, August 15th – 26th, 2022
4. R4-2215665 “On FR1 2UL inter-band CA UE coexistence requirements”, Apple, 3GPP TSG-RAN WG4 Meeting #104bis-e, October 10th – 19th, 2022
5. R4-2215737 “Views on FR1 inter-band UL CA co-existence requirements”, Samsung, 3GPP TSG-RAN WG4 Meeting #104bis-e, October 10th – 19th, 2022
6. R4-2216043 “Discussion on 2UL inter-band CA coexistence requirements”, Xiaomi, 3GPP TSG-RAN WG4 Meeting #104bis-e, October 10th – 19th, 2022