IEEE 802

Local and Metropolitan Area Network Standards Committee

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Subject	Liaison Statement to 3GPP RAN/RAN1: IEEE 802 response to 3GPP RAN1 LS dated November 2016 (R1-1613770)
Approval	Agreed to at IEEE 802 Plenary Session, Vancouver BC, 17 March 2017

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[1] This document solely represents the views of the IEEE 802 LMSC, and does not necessarily represent a position of the IEEE or the IEEE Standards Association.

Dear Chairs of 3GPP RAN and RAN1,

Thank you once again for supporting the ongoing cooperation over the last year or so between IEEE 802 and 3GPP RAN/RAN1 in relation to coexistence issues between LAA and 802.11 systems. This cooperation will hopefully ensure the various versions of LAA are designed in such a way that LAA systems will coexist fairly with 802.11 in unlicensed spectrum.

The following table contains a summary from IEEE 802's perspective of the status, in terms of consensus and resolution, of the fourteen issues related to LAA/802.11 coexistence that were addressed in 3GPP RAN1's most recent Liaison Statement to IEEE 802 in November 2016 (R1-1613770). Details of IEEE 802's current position on each issue are included in the appendix of this Liaison Statement.

The table also summarizes the status at the time of IEEE 802's previous Liaison Statement to 3GPP RAN1 dated 1 August 2016 (IEEE EC-16-0140-01-00EC), for information purposes. The status column is color coded to indicate the level of consensus on each issue. Green indicates "consensus" or "resolution"; red indicates "lack of consensus" or "no resolution"; orange indicates "progress towards consensus" or "progress towards resolution".

IEEE 802 looks forward to a continued, productive interchange with 3GPP RAN/RAN1/RAN4 on these and other issues related to LAA/802.11 coexistence during the development of LAA Rel. 14.

For your information, the next two IEEE 802 meetings are on 7-12 May 2017 in Daejeon, Korea and 9-14 July 2017 in Berlin, Germany.

Regards,

/s/ Paul Nikolich

Paul Nikolich, Chairman, IEEE 802 Executive Committee

#	Comment by IEEE 802 in Liaison Statement to 3GPP RAN1	Previous status	Current status
1	*Radio equipment in unlicensed spectrum should not transmit energy for the primary purpose of blocking access to the channel to others*	Possibility for consensus & resolution	Consensus, subject to use of multiple starting positions
2	*Transmission of Discovery Reference Signals should be clearly bounded to avoid excess airtime overhead on unlicensed spectrum*	Some consensus, but not fully resolved	Consensus, subject to field experience
3	*Radio equipment in unlicensed spectrum should detect neighboring networks with sufficient sensitivity to ensure fair coexistence*	No consensus, and not resolved	No consensus, but possible with RAN4 testing before deployment
4	*LAA and IEEE 802.11 slot boundaries should align as accurately as possible to preserve spectral efficiency in unlicensed spectrum*	No consensus, and not resolved	No consensus, but possible with RAN4 testing before deployment
5	*LAA and 802.11 multi-channel aggregation schemes should align*	No consensus, wait for measurements	No consensus, awaiting 3GPP response
6	*Radio equipment in unlicensed spectrum should stop transmission as soon as transmission of useful data is complete*	Possibility for consensus & resolution	Consensus, subject to use of multiple ending positions
7	*Channel access that is obtained using special access mechanisms for high priority data should not be used to transmit lower priority data*	Consensus but not fully resolved	Consensus, subject to use of short sub-frames
8	*The maximum continuous transmission time should be limited to avoid blocking latency sensitive traffic on coexisting networks*	Consensus but not fully resolved	No consensus, but possible with RAN4 & field testing
9	*Adjustment of channel access contention window should be based on comparable indicators of congestion to ensure fairness between technologies*	No consensus, wait for measurements	No consensus, but possible with use of RAN4 testing
10	*Adjustment of channel access contention window should be clearly defined*	Consensus, and resolved	Consensus, and resolved
11	*The channel access state machine during channel sensing should be clearly defined*	Consensus, and resolved	Consensus, and resolved
12	*The use of the back off mechanism should be clearly defined*	Substantial consensus, but not fully resolved	Consensus, and resolved
13	*Issues related to ED threshold and coexistence between LAA and IEEE 802.11*	n/a	No consensus, but possible with RAN4 testing
14	*Continued dialog towards a future framework for efficient sharing of the 5 GHz band*	n/a	Waiting for RAN decision

Appendix: responses to 3GPP RAN1's Liaison Statement (R1-1613770)

1. **There is consensus on Issue 1: "*Radio equipment in unlicensed spectrum should not transmit energy for the primary purpose of blocking access to the channel to others*" but resolution is subject use of multiple starting positions**

IEEE 802 suggested in its Liaison Statement to 3GPP RAN1 dated 18 March 2016 (IEEE 802 19-16-0037-09-0000-laa-comments.pdf) that *LAA should be modified to avoid sending energy for the primary purpose of blocking access to the channel to others.* IEEE 802 continued to argue for this important principle in its Liaison Statement to 3GPP RAN1 dated 1 August 2016 (IEEE 802 EC-16-0140-01-00EC). In the same Liaison Statement, IEEE 802 suggested (Response 1.1) a compromise solution whereby the LAA Rel. 13 specification is modified to include a recommendation that implementations should avoid transmitting *any signals in a channel between the time a device obtains access to the channel using LBT Category 4 and the time of the next subframe or partial subframe boundary*. As an alternative, IEEE 802 suggested (*Response 1.2*) that 3GPP RAN1 define *additional partial sub-frame starting positions in LAA Rel. 13, so that the need to send reservation signals is minimized*.

3GPP RAN1 responded to IEEE 802 in its Liaison Statement to IEEE 802 dated November 2016 (3GPP R1-1613770). In the first part of its response, 3GPP RAN1 asserted that such reservation signals represent legitimate overhead. However, 3GPP RAN1 also notified IEEE 802 that there is discussion of *adding a statement in 36.300 to minimize the transmission of such signals.* In the second part of its response, 3GPP RAN1 noted that *shortened TTI[2] candidates may be incorporated into FS3 for LAA in the future* as a follow on from the current work to add *2-symbol, 4-symbol and 1-slot TTI* to Release 14 for *FS1 and FS2.*

IEEE 802 does not agree that reservation signals are legitimate overhead, at least partially based on 3GPP RAN1's assertion in a previous Liaison Statement to IEEE 802 that *deferring sending energy until a subframe boundary or partial subframe boundary … provided good LAA performance.* This assertion highlights the unnecessary nature of these reservation signals thus emphasizing their illegitimacy in unlicensed spectrum. However, IEEE 802 is pleased that 3GPP has decided (3GPP RP-170848) to adopt IEEE 802's suggestions for a recommendation to avoid the use of reservation signals by making LAA to include more partial sub-frame starting positions (albeit not in LAA Rel. 13/14).

IEEE 802 now believes that this issue is heading towards consensus based on 3GPP RAN1's efforts to minimize the time between the time a device obtains access to the channel and the next sub-frame. In the meantime, IEEE 802 requests that:

- 3GPP RAN1 provide a copy of the proposed *statement in 36.300* as soon as it is available for IEEE 802's consideration and comment

- 3GPP RAN1 notify IEEE 802 on the progress of the work item to incorporate multiple starting positions for LAA along with the granularity of these positions

- 3GPP RAN1 confirm that the use of multiple starting positions by LAA will be made mandatory to minimize transmission of reservation signals

- 3GPP RAN1 reconsider fair coexistence with 802.11 if LAA systems are modified as part of this work item.

IEEE 802 also thanks 3GPP for clarifying that the usage of partial sub-frames does not make HARQ operation inefficient.

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[2] transmission time intervals

2. **There is consensus on Issue 2: "*Transmission of Discovery Reference Signals should be clearly bounded to avoid excess airtime overhead on unlicensed spectrum*" but final resolution will depend on satisfactory field experience**

IEEE 802 expressed a concern in its Liaison Statements to 3GPP RAN1 dated 18 March 2016 (IEEE 802 19-16-0037-09-0000-laa-comments.pdf) and 1 August 2016 (IEEE 802 EC-16-0140-01-00EC) that there was the potential for excessive DRS overhead with short LBT periods. IEEE 802 requested that 3GPP RAN1 define much tighter constraints on the DRS overhead in LAA Rel. 13.

3GPP RAN1 responded to this concern in its Liaison Statement to IEEE 802 dated November 2016 (3GPP R1-1613770). It noted that the DRS limit agreed in 3GPP RAN1 *is only a strong upper bound for the amount of time to be used with 25us LBT*, and that it is 3GPP RAN1's expectation that most DRS will be transmitted using Cat 4 LBT access.

It appears there is consensus between IEEE 802 and 3GPP RAN1 that the use of 25us LBT access for DRS should be limited. IEEE 802 is willing to accept 3GPP RAN1's expectation that it will be limited in practice, subject to satisfactory experience in field deployments.

3. **There is not consensus on Issue 3: "*Radio equipment in unlicensed spectrum should detect neighboring networks with sufficient sensitivity to ensure fair coexistence*" but successful RAN4 testing before deployment may lead to resolution**

Issue 3 is addressed in a separate Liaison Statement from IEEE 802 (https://mentor.ieeeorg/802-ec/dcn/17/ec-17-0064-00-00EC-802-to-3gpp-ran-ran1-ran4-liaison-statement.pdf). There is not yet consensus on this issue, but resolution is possible based on the completion of suitable test plans by 3GPP RAN4 and the successful execution of those test plans on LAA systems with satisfactory results before their deployment.

4. There is not consensus on Issue 4: "*LAA and IEEE 802.11 slot boundaries should align as accurately as possible to preserve spectral efficiency in unlicensed spectrum*" but resolution can result from satisfactory RAN4 testing before deployment

IEEE 802 highlighted several issues related to slot synchronisation in its Liaison Statement dated 1 August 2016 (IEEE 802 EC-16-0140-01-00EC). In particular, IEEE 802 noted that in the absence of slot synchronisation the system will be more like ALOHA rather than slotted-ALOHA. IEEE 802 suggested that the situation would be improved by LAA detecting 802.11 preambles or finer grained energy detection. Finally, IEEE 802 explained why the *SI simulations cannot reasonably be used to draw any conclusions about the details of LAA Rel. 13 coexistence with IEEE 802.11*.

3GPP RAN1 responded in its Liaison Statement to IEEE 802 dated November 2016 (3GPP R1-1613770). 3GPP RAN1 noted that good slot synchronisation between LAA and 802.11 is only possible if all systems transmit and receive 802.11 preambles and NAVs, but also notes that this would not be technology neutral. IEEE 802 agrees that this is best solution for slot synchronisation and thus fair and efficient use of the spectrum. Further, IEEE 802 asserts such a solution is "technology neutral" if it is the only way to achieve these goals.

3GPP RAN1 also challenged IEEE 802's comments about the efficacy of the SI simulations to prove LAA and 802.11 fairly coexist in any cases beyond the very simple indoor scenario with the known limitations of the chosen propagation model. IEEE 802 does not believe it is productive to argue further about simulations and associated assumptions at this point.

IEEE 802 notes that *RAN4 has decided on the development of a set of coexistence test cases including multi-node tests to verify the coexistence between LAA and IEEE 802.11 devices in various scenarios*. IEEE 802 requests that the question of the effect of lack of slot synchronization be examined in these coexistence tests, as well as in actual deployment scenarios. IEEE 802 requests that 3GPP define and perform the RAN4 tests to verify coexistence between LAA and IEEE 802.11, before deployment of any LAA systems.

5. There is not consensus on Issue 5: "*LAA and 802.11 multi-channel aggregation schemes should align*" issue with resolution waiting for 3GPP response

IEEE 802's Liaison Statement to 3GPP RAN1 dated 18 March 2016 (IEEE 802.19-16-0037-09-0000-laa-comments.pdf) observed in relation to Issue 5 that non-contiguous and/or differently aligned use of spectrum causes each LAA eNB to impact multiple 802.11 networks. IEEE 802 suggested that LAA should align its multi-channel aggregation scheme with 802.11.

3GPP RAN1's response to this comment was included in 3GPP RAN1's Liaison Statement dated 7 June 2016 (R1-166041). The response rejected IEEE 802's request on the basis that its adoption would reduce LAA performance, as well as 802.11 performance.

In IEEE 802's subsequent Liaison Statement to 3GPP RAN1 dated 1 August 2016 (IEEE 802 EC-16-0140-01-00EC) IEEE 802 pointed out that because 802.11 multi-carrier schemes follow channel bonding rules, while the LAA multi-carrier scheme can flexibly select any group of carriers for transmission, this additional channel access flexibility for LAA naturally means that LAA will gain higher channel access at the expense of co-channel 802.11. Citing this, IEEE 802 continued to argue for the need for LAA to align its multi-channel aggregation scheme with 802.11 in order to fairly share unlicensed resources between LAA and 802.11.

3GPP RAN1 responded to IEEE 802 in its Liaison Statement dated November 2016 (3GPP R1-1613770). The RAN1 response noted the following two points copied verbatim below:

- *For UEs performing multi-carrier transmission on the uplink, it was also agreed that a UE that has received UL grants on a set of carriers scheduled with Cat 4 LBT with the same starting point in a subframe on all carriers can switch to 25us LBT, if Cat 4 LBT has been performed on a designated carrier in the set of carriers, where the set of carriers is specified according to the ETSI channel bonding rules.*

- *RAN1 notes that in multi-carrier access schemes that perform independent LBT per carrier, the whole Cat 4 LBT procedure has to be completed on each carrier before any given transmission and hence in principle each carrier waits for its fair share of time determined by congestion and collisions on that carrier before it accesses the medium.*

IEEE 802 is pleased to note from the first point that 3GPP RAN1 has decided to align the uplink LAA (eLAA) multi-channel aggregation scheme with 802.11, in the case where the multi-channel CCA scheme is similar to 802.11. IEEE 802 thanks 3GPP RAN1 for this positive development.

On the second point, 3GPP RAN1 has noted that downlink LAA multi-channel CCA schemes that perform an independent Cat 4 LBT procedure (i.e. CCA with exponential backoff on each carrier) and hence wait their "fair share of time" on each carrier, can be fair to 802.11.

However, IEEE 802 notes that this is not the only multi-channel CCA scheme allowed by downlink LAA. Downlink LAA is also allowed to flexibly select carriers for multi-channel transmission even in the case where it performs such Cat4 LBT on only one of the carriers and 25us LBT on the remaining carriers. The latter procedure (denoted as Type B multi-carrier access in the 3GPP LAA specifications) will naturally result in LAA getting a higher share of channel access relative to 802.11. In view of this, IEEE 802 requests that 3GPP RAN1 align the multi-channel aggregation scheme for this latter downlink channel access procedure with 802.11, the principle being that if the LAA multi-channel CCA scheme is similar to 802.11, it should also follow the multi-channel aggregation scheme of 802.11, in order for both technologies to share the spectrum fairly.

IEEE 802 also notes that updates to the 5 GHz harmonized standard EN 301 893 (ETSI EN 301 893 V2.0.7 (2016-11)) in ETSI-BRAN require that downlink LAA has to mandatorily follow a multi-channel aggregation scheme similar to 802.11 in the case where the multi-channel CCA scheme is similar to 802.11.

IEEE 802 also notes that the above ETSI mandate together with the 3GPP goal of a "single global solution" for LAA should naturally imply that downlink LAA must always follow multi-channel aggregation scheme similar to 802.11 in the case where it uses multi-channel CCA similar to 802.11.

IEEE 802 also requests 3GPP to define and perform the RAN4 tests before LAA deployment to verify coexistence between multi-channel LAA and 802.11.

6. There is consensus on Issue 6: "*Radio equipment in unlicensed spectrum should stop transmission as soon as transmission of useful data is complete*" but final resolution is subject to use of multiple ending positions

IEEE 802 requested a confirmation in its Liaison Statement dated 1 August 2016 (IEEE 802 EC-16-0140-01-00EC) that a *LAA Rel. 13 system is mandatorily required to end transmission at the shortest end partial sub-frame boundary when it has no more data to transmit of the appropriate channel access priority class(s)*. IEEE 802 thanks 3GPP RAN1 for the requested confirmation in its Liaison Statement to IEEE 802 dated November 2016 (3GPP R1-1613770).

IEEE 802 is pleased to note that 3GPP may be in a position to adopt IEEE 802's suggestions for stopping LAA transmission as soon as transmission of useful data is complete once support for increased number of ending positions in an LAA sub-frame, as specified in 3GPP RP-170848, is enabled. IEEE 802 now believes that this issue is heading towards consensus. In the meantime, IEEE 802 requests that:

- 3GPP RAN1 notify IEEE 802 on the progress of the work item to incorporate multiple ending positions for LAA along with the granularity of these positions.

- 3GPP RAN1 confirm that LAA devices will support these multiple ending positions in a sub-frame in a mandatory way.

7. **There is consensus on Issue 7: "*Channel access that is obtained using special access mechanisms for high priority data should not be used to transmit lower priority data*" but final resolution is subject to the use of shorter sub-frames**

IEEE 802 requested in its Liaison Statement dated 1 August 2016 (IEEE 802 EC-16-0140-01-00EC) for *LAA Rel. 13, the minimum duration be approximated to the next occurring (partial) sub-frame boundary (one of 3/6/9/10/11/12/14 OFDM symbols).* IEEE 802 further requested, as a compromise, that *for future releases of LAA (starting with Rel. 14), 3GPP should define partial sub-frames with a finer granularity including the provision for a sub-frame with 1 OFDM symbol.*

3GPP RAN1 responded in its Liaison Statement to IEEE 802 dated November 2016 (3GPP R1-1613770) by noting that *the choice of size of the partial subframes to be used is also a function of the specification impact for considering many different sizes, eNB and UE implementation complexity and also the incremental gains that can be obtained.*

IEEE 802 is pleased to note that 3GPP has decided to specify support for multiple starting and ending positions in an LAA sub-frame, as specified in 3GPP RP-170848. IEEE 802 requests that 3GPP RAN1 not only use this feature but also define shorter sub-frames for LAA similar to what are defined for licensed LTE as part of 3GPP RP-161299. This will ensure that transmissions of finer granularity are possible for LAA, in order to better approximate the channel occupancy to the minimum time required to transmit higher priority data, in the case the channel has been obtained using the access mechanisms of the higher priority data and not allow transmission of lower priority data.

In the meantime, IEEE 802 requests that:

- 3GPP RAN1 notify IEEE 802 on the progress of the work item to incorporate multiple starting and ending positions for LAA and specifically whether it will also provision shorter sub-frames for LAA.

- 3GPP RAN1 confirm that such multiple starting and ending positions and shorter sub-frames will be supported by LAA devices in a mandatory manner

8. There is not consensus on Issue 8: "*The maximum continuous transmission time should be limited to avoid blocking latency sensitive traffic on coexisting networks*", but resolution can result from satisfactory RAN4 testing & deployment experience

IEEE 802 requested in its Liaison Statement dated 1 August 2016 (IEEE 802 EC-16-0140-01-00EC) that *LAA Rel. 13 aligns with the agreement that was achieved at ETSI-BRAN* for maximum TXOP.

3GPP RAN1 responded in its Liaison Statement to IEEE 802 dated November 2016 (3GPP R1-1613770) that while *RAN1 may consider alignment with all aspects of the ETSI BRAN specification including MCOT limits* it is *the responsibility of the eNB to comply with any regional regulations*.

IEEE 802 is disappointed with 3GPP RAN1's position to not adopt the maximum TXOPs agreed in ETSI BRAN (EN 301 893) by stakeholders from both the 802.11 and LAA communities. The limits in EN 301 893 represent a compromise by all stakeholders that is likely to enhance fair sharing of the 5GHz band globally. Given these limits will be required in Europe and the many countries that align with European regulations, the adoption of these limits by 3GPP RAN1 into LAA has the added advantage for LAA of enabling a "single global solution" as mandated for LAA by 3GPP.

IEEE 802 also notes that 3GPP has already adopted the maximum TXOP limits agreed in EN 301 893 for uplink LAA (eLAA). In that case IEEE 802 is unable to understand the reluctance by 3GPP RAN1 to also adopt them as part of the LAA specifications for downlink LAA. IEEE 802 requests 3GPP RAN1 to clarify why it has decided to follow such different stances between downlink and uplink LAA. It strongly urges 3GPP to resolve this difference and hence adopt the maximum TXOP limits as specified in EN 301 893 for both downlink and uplink LAA.

IEEE 802 notes that *RAN4 has decided on the development of a set of coexistence test cases including multi-node tests to verify the coexistence between LAA and IEEE 802.11 devices in various scenarios*. IEEE 802 requests that the effect of maximum TXOP limits on LAA/802.11 coexistence be examined in these coexistence tests as well as actual deployment scenarios.

9. There is not consensus on Issue 9: "*Adjustment of channel access contention window should be based on comparable indicators of congestion to ensure fairness between technologies*" but resolution can result from satisfactory RAN4 testing

IEEE 802 suggested in its Liaison Statement dated 1 August 2016 (IEEE 802 EC-16-0140-01-00EC) that *extensive simulation and testing of LAA and 802.11 coexistence be conducted to determine whether fair sharing of the channel actually occurs in typical medium to high congestion environments*. This recommendation was based on the difficulty of predicting the interaction LAA and 802.11 given the many differences (and similarities) in their medium access mechanisms.

3GPP RAN1 responded in its Liaison Statement to IEEE 802 dated November 2016 (3GPP R1-1613770) by addressing several technical sub-issues discussed in IEEE 802's Liaison Statement, and finished by declining IEEE 802's offer to work closely with 3GPP RAN1 on additional and extensive simulation and testing on the basis that such work is unnecessary. IEEE 802 disagrees that such testing is unnecessary and believes the 3GPP RAN4 testing activities provides a suitable forum for such work. IEEE 802 also believes that targeted simulation work may also provide value in some cases.

In addressing the differences between immediate ACKs in LAA and 802.11, 3GPP RAN1 noted that *as part of a Rel-14 work item on shortened TTI and processing time, the minimum latency between the DL PDSCH and DL HARQ feedback for legacy 1ms TTI operation is to be reduced from the current 4ms for all frame structures (FS) including FS3 used for LAA*. IEEE 802 requests that 3GPP RAN1 notify IEEE 802 on the progress of the work item.

In view of the differences in medium access mechanisms between LAA and 802.11, IEEE 802also requests that 3GPP RAN4 define coexistence tests in medium and high congestion environments to determine whether the channel is fairly shared in such environments. .

10. There is consensus and resolution of Issue 10: "*Adjustment of channel access contention window should be clearly defined*"

Issue 10 was declared resolved in IEEE 802's Liaison Statement to 3GPP RAN1 dated 1 August 2016 (IEEE 802 EC-16-0140-01-00EC). No further action is required.

11. There is consensus and resolution of Issue 11: "*The channel access state machine during channel sensing should be clearly defined*"

Issue 11 was declared as resolved in IEEE 802's Liaison Statement to 3GPP RAN1 dated 1 August 2016 (IEEE 802 EC-16-0140-01-00EC). No further action is required.

12. There is consensus on Issue 12: "T*he use of the back off mechanism should be clearly defined*" and it has been largely resolved

IEEE 802 highlighted two issues related to the backoff mechanism in its Liaison Statement dated 1 August 2016 (IEEE 802 EC-16-0140-01-00EC).

In relation to the first issue, IEEE 802 requested clarification that LAA maintained slot synchronisation in cases *where the next transmission is ready after the post backoff is complete*. 3GPP RAN1 responded in its Liaison Statement to IEEE 802 dated November 2016 (3GPP R1-1613770) that LAA can maintain slot synchronisation by *continuously monitoring the channel.* IEEE 802 agrees that this is an appropriate mechanism, and further requests confirmation that LAA actually undertakes this monitoring, at least most of the time.

In relation to the second issue, IEEE 802 noted an ambiguity in the way *a station with a frame that becomes ready after a previous post transmission backoff is allowed to transmit*. 3GPP RAN1 responded in its Liaison Statement to IEEE 802 dated November 2016 (3GPP R1-1613770) by noting a corresponding change to the LAA specification. IEEE 802 agrees this modification appears to resolve the issue and thanks 3GPP RAN1 for their action.

13. There is not consensus on Issue 13: "*Issues related to ED threshold and coexistence between LAA and IEEE 802.11*" but resolution can result from satisfactory RAN4 testing before deployment of LAA

Issue 13 is addressed in a separate Liaison Statement from IEEE 802 (https://mentor.ieeeorg/802-ec/dcn/17/ec-17-0064-00-00EC-802-to-3gpp-ran-ran1-ran4-liaison-statement.pdf) . There is not yet consensus on this issue, but resolution is possible based on the completion of suitable test plans by 3GPP RAN4 and the successful execution of those test plans with satisfactory results before the deployment of LAA.

14. Resolution of Issue 14: "*Continued dialog towards a future framework for efficient sharing of the 5 GHz band*" is waiting for a 3GPP RAN response

IEEE 802 indicated an *interest in a continued dialog towards a future framework for efficient sharing of the 5 GHz band* in its Liaison Statement dated 14 November 2016 (IEEE 802 EC-16-0203-00-00EC). 3GPP RAN1 included a response to this request in its Liaison Statement to IEEE 802 dated November 2016 (3GPP R1-1613770), deferring the question to 3GPP RAN. IEEE is awaiting the response from 3GPP RAN.