3GPP TSG-RAN Meeting #89-eRP-20xxxx

Electronic Meeting, 14-18 September 2020

Agenda Item: 9.1.1

Source: Email discussion moderator (Huawei)

Title: Report #1 from Email Discussion [10][6GHz\_licensed]

Document for: Discussion and decision

# 1 Introduction

This documents reports on the following email discussion during RAN#89-e:

**[89E][10][6GHz\_licensed]**

Goal: addressing potential work on 6GHz licensed band.

Input contributions covered: 1745, 1744, 1438.

There are two things to discuss in this email thread:

* the WID proposal in RP-201744
* the possible response to the LS received from RCC countries in RP-201438

Initial round of discussion is over (see section 2 for responses and moderator’s summary).

Second round of discussion (see section 3): Please respond by Wednesday 16 September at 10:59h UTC.

Instructions for naming the file after updating:

After update by company B: filename-v220-companyA-companyB

After update by company C: filename-v221-companyB-companyC

## 2 Initial round discussion

### 2.1 Question 1: WID objectives proposed in RP-201744

The objectives of the WID proposal in RP-201744 are the following:

The objectives of the core part work item are:

* Determine the band plan for at least two bands for licensed operation in the range of 5925- 7125 MHz
  + 6425-7125 MHz
  + 5925-7125 MHz
* Define system parameters such as channel bandwidths and channel arrangements
* Define transmitter and receiver characteristics requirements for the UE
* Define transmitter and receiver characteristics requirements for the BS

The objective of the performance part work item is to define:

* Conformance requirements for BS testing
* Changes are to be added in release independent manner.

Companies are invited to provide their views on the objectives of the work proposed in RP-201744.

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| **Company** | **Comments** |
| Charter Communications Inc | We do not approve the objectives of this WID as there has not been regulatory framework completed for these two bands for licensed operation. Once regulatory framework is completed, we are open for this wid to be opened |
| Nokia | We are fully supportive of defining these bands as soon as complete regulatory requirements are available, but we should not approve WIs for RAN4 for bands for which regulatory requirements are not available. |
| Apple | With regards to a new 6GHz WI proposal, our understanding is that 3GPP can consider adding new licensed bands in the 6GHz frequency band once we have the corresponding regulatory decisions. Since this topic is still under discussion in regulatory bodies, it will be premature to agree now this WI. |
| Broadcom | We have strong concerns with regard to the objectives of this WID which are not based on a completed regulatory framework. If such a framework was available then the WID proposal should follow the regular 3GPP procedures |
| Hewlett Packard Enterprise | We cannot support the proposal to define licensed operation in the 6 GHz band in the absence of a corresponding regulatory framework. |
| Facebook | We do not agree with this WID in both proposed bands as there are no established regulatory requirements. |
| Huawei/HiSilicon | We observe there is tremendous industry support for defining IMT licensed band for 6GHz, as shown in the justification of the WID. This purpose of this WID proposal is to address such industry demands. The comments on regulatory framework are understandable. However, there are also precedents that 3GPP agreed to start the work on some bands without the regulatory framework available at that time. Such most recent example is the unlicensed band definition for 6GHz. It is true that regulatory framework is needed before fully completing a band definition in 3GPP. On the other hand, it is also noted that some general RF requirements are not dependent on specific regulatory framework. Thus, we support approving the 6GHz licensed band WI in this RAN plenary. |
| Qualcomm | We fail to see the motivation for approving this WID when the regulatory framework is simply inexistent. Indeed, one could argue that having 3GPP approving this WID and starting any work on it would send a distorted signal to the outside world. It also sets a wrong precedence for 3GPP to embark into a new band definition work without supporting regulations.  The example that Huawei provides is, actually, flawed. The NR-U WID project was approved with the following statements:  *This work item will specify NR enhancements for a single global solution framework for access to unlicensed spectrum which enables operation of NR in the 5GHz and the 6GHz (e.g., US 5925 – 7125 MHz, or European 5925 – 6425 MHz, or parts thereof) unlicensed bands taking into account regional regulatory requirements.*  *~~~~~*  *Note 1: The actual frequency range for specification can be further discussed based on regulatory updates in the US and Europe*.  Air interface for 5GHz and 6GHz is harmonized under the same framework so there was nothing specific done for 6GHz. RAN4 did not start discussing 6GHz until the FCC order for the corresponding band was issued.  Despite the existence of a very clear framework for the FCC 6GHz band, the work progress has been deliberately obstructed and derailed without good technical grounds and hence, the irony of this proposal. |
| CMCC | We support this work item. As indicated by companies, there is tremendous industry interests and support for defining IMT licensed band for 6GHz. We fail to understand why defining the band has to wait for the completion of all the regulations, especially when some regulatory already request 3GPP to define 6GHz licensed band.  There are many requirements that are generic and can be discussed without regulation, including system parameter, ACLR, ACS, REFSENS, blocking, power class, co-existence with other 3GPP bands. We don’t need to wait for the completing of regulations to start the WI. The general requirements can be discussed first in order to facilitate the specification of 6GHz licensed band and meet the demands from different regions. |
| China Telecom | In our view, finalizing the regulation is not a pre-requisite to approve the WID for a certain band. According to previous experiences, a number of WID for important bands were approved based on industry interests rather on the condition that regulation is not ready. For example, the Rel-16 NR-U WID includes 6GHz unlicensed band in June 2019 while the FCC regulation was published until April 2020. (But of course the completion of WI needs concrete input of regulation).  Besides, according to our understanding,  many requirements for 6GHz licensed band would be independent of regulation, and only part of RF requirement like band plan, additional regional spurious depends on the completion of regulation.  Therefore, we support approving this WI at this meeting. |
| OPPO | We noticed there is LS from some regions regarding the licensed spectrum use of 6GHz and also the discussions in WRC. Generally this depends on each country/region on how to use 6GHz, in our view it is ok for certain region to use 6GHz as unlicensed while other regions use 6GHz as licensed. Therefore, we are ok with the motivation of introducing this new licensed band in 6GHz and also ok with making the unlicensed use of 6GHz according to market demands. This is not something new. |
| CATT | We understand the situation mentioned by previous companies. The regulation on 6GHz is not finalized. However, it is not he first time that 3GPP approve a spectrum WI/SI before the regulation is ready. This is a very important band for IMT. There are clear interests and demands from industry. We think it’s reasonable to start 3GPP work to address the regional demand and industry interests. We also agree with CT’s comments that only the completion of the WI needs concrete input of regulation. |
| Orange | Orange is willing to approve a WI to define the requirements for the introduction of the upper 6 GHz band (6425-7125 MHz) in licensed mode. While it is true that the regulation framework is not completely finalised in Europe, it is clear that work can be anticipated in order to address the generic requirements first.  It seems also necessary to give a clear intent at 3GPP level on the specification of all the different flavours of licensing mode across different regions on 6 GHz (fully unlicensed, fully licensed, and partly unlicensed and licensed). In that respect, we believe each region should take a neutral approach on the licensing mode chosen by other regions. |
| CBN | According to the justification of the WID, there are sufficient interest to use 6GHz spectrum for licensed application in Russian, China and Europe. And there are many operators/vendors from different regions supporting this WI. We see urgency to make 6GHz range defined for licensed use in 3GPP as soon as possible, and we support the scope of the WID. |
| ZTE | We support this WID as we could see the clear demand from many regions and globally and we could be listed as supporting company.  For dependency between regulatory requirement and band definition work, we did have some precedent cases e.g. EESS protection which was also discussed after mmWave bands are introduced, scaling factor for BS spurious emission in ECC PT1 was also discussed after FR1 NR bands introduced. Therefore this 6GHz WID and regulatory requirements could be done in parallel we think.  In addition,the work in ITU-R reply SI on 6GHz could be used as starting point of this band definition in which licensed operation was also assumed. |
| Spreadtrum | The strong need of studying the licensed band on 6GHz has been shown from WRC and other societies and starting this WI can help more countries to deploy 5G NR on more available bands in an early stage. Regarding to the regulation issue, we think the time when the regulation framework is finished only affects the WI completion time rather than the starting time. The specification work that is not related to the regulation can be started first and then some requirement related to the regulation can be started when the regulation is clear. |
| Cisco | We do not support the proposal, since the LS clearly shows that the regulatory framework is not complete. First the regulatory framework in 6 GHz band needs to be completed, before WID can be agreed in 3GPP. |
| Deutsche Telekom | #Not many words:  We simply support approving this WI during this meeting.  #Thanks.  *SIDENOTE:*  *3GPP companies should not fall into playing these “regional games” !*  *This is not healthy for the entire industry and I am allowed to say this as Deutsche Telekom has clear business demands in Europe* ***as well as*** *in the USA.*  *Thanks.* |
| Ericsson | We support the approval of the WID in this plenary since there is substantial industry interest to specify 6GHz band for license operation in certain regions. We also agree with previous comments that several requirements are generic that can be done while 3GPP anticipates information about the regulatory frame work from RCC. |
| China Unicom | We support this WID. We are very interested to define licensed spectrum in 6GHz frequency band for industry and other applications. General RF requirements can be discussed before regulatory framework is completed. We do not think that we have to wait for all regulatory requirements being specified before starting this WI. |
| Lenovo, Motorola Mobility | Considering the strong business interest from vertical, we are supportive of this WID. Regarding the 6GHz band, we fully understand this is dependent on regional/country-specific usage. From our point of view, making the 6GHz band licensed is important for some countries, e.g., China. It is not necessary to delay this WID simply because the regulatory requirements in uninterested countries/regions are not completed. |
| Intel | We acknowledge that several regions have shown an interest in and are working towards using 6GHz for licensed NR operation. At the same time, in our understanding the regulatory studies are still ongoing and no final conclusions on the requirements were reached. The regulatory requirements are indeed required for the RF band definition in 3GPP and without such information we doubt that the work on the RF requirements can be finalized. We propose to wait for further regulatory decisions on 6GHz licensed operation before proceeding with the actual 3GPP work. |
| CAICT | According to the justification part of the draft WID and the LS from RCC countries, it is clear that there are strong support/interest from industry and regulatory bodies. We are therefore in a supportive position for RAN to approve this WID and to start the work of defining 6GHz licensed band. |
| MTK | We support to approve this WID due to strong demands in certain regions. We also share similar view with the majority of companies that the approving of the WI does not need to wait for the finalization of all regulatory requirement. Some generic requirements that are region-agnostic can be discussed first. |
| CommScope | We don’t support this WID. Licensed and by implication wide-area outdoor operation will not co-exist with the current incumbent services of FS and FSS. This has been the conclusion of the [FCC Report and Order](https://docs.fcc.gov/public/attachments/FCC-20-51A1.pdf) in the US and the ECC Reports [302](https://docdb.cept.org/download/cc03c766-35f8/ECC%20Report%20302.pdf) and [316](https://docdb.cept.org/download/8951af9e-1932/ECC%20Report%20316.pdf) in the European Region.  In both regions the studies performed in support of the request to allow WAS/RLAN access to 6 GHz spectrum have concluded that the lower power levels associated with this technology when used indoors and very low powers outdoors can co-exist with incumbent services. Furthermore, in the US, the FCC concluded that Standard power services could co-exist if they are controlled by an AFC solution. |

**Moderator’s summary of first round discussions**

**Support approving the WI in this meeting (17)**: Huawei, HiSilicon, CMCC, China Telecom, OPPO, CATT, Orange, CBN, ZTE, Spreadtrum, DT, Ericsson, China Unicom, Lenovo, Motorola Mobility, CAICT, MediaTek

**WI approval should come after regulatory requirements are available (9)**: Charter, Nokia, Apple, Broadcom, Hewlett Packard Enterprise, Facebook, Qualcomm, Cisco, Intel

69% of companies who responded support approving the WID at RAN#89. Among these companies, several mentioned that generic RF requirements can be defined before regulatory requirements are available (such as parameters studied in preparation to the response to ITU-R on sharing studies). Companies generally recognized that the completion of the work depends on the availability of regulatory requirements. Some companies expressed concerns on starting a WID for a band that is not yet allocated with regulatory requirements, while other companies pointed to past examples where regulatory requirements were not available yet 3GPP started part of the work (independent of regulatory details) when the intent to define regulations and allocate the band was known prior to approving the work in 3GPP.

The moderator would find it useful to clarify which aspects of the work depends on regulatory requirements, and which aspects don’t. Some details were provided in the answers from some companies, as summarized below, but the list may not be complete.

Requirements that do not depend on availability of regulations:

* System parameter (e.g. channel bandwidth)
* ACLR
* ACS
* REFSENS
* Blocking
* Power class
* Co-existence with other 3GPP bands

Requirements that depend on availability of regulations:

* Band plan
* RF band definition
* Additional regional spurious relevant to regulations

### 2.2 Question 2: WID timeline proposed in RP-201744

The WID in RP-201744 proposes to start the WI at RAN#89 and to complete the core part at RAN#93.

Companies are invited to provide their views on the timeline of the work proposed in RP-201744.

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| **Company** | **Comments** |
| Charter Communications Ins. | A timeline for this WID cannot be estimated as the regulatory framework completion date is still not available. |
| Nokia | Agreed with Charter. |
| Apple | A timeline can be discussed only when we have the corresponding input from the regulatory bodies. |
| Broadcom | It is pointless discussing a timeline at this moment. |
| Hewlett Packard Enterprise | We agree with the previous comments that it will remain premature to discuss a timeline for the proposed work item until a regulatory framework has been established. |
| Facebook | It is premature to discuss the proposed timeline due to contingency on first establishing regulatory certainty for the 6GHz bands. |
| Huawei/HiSilicon | We support starting this WI from this RAN plenary. The completion time can be tentatively set to the end of Rel-17, which can be further adjusted based on future agreements. |
| CMCC | We support to approve this WI. |
| China Telecom | We support starting this work from Q4 2020. |
| OPPO | We are ok to the time plan, and in our view the market demands shall be met in a timely manner once it is shown and also the regulation requirements can be considered once it is ready before the completion of the WI (there are numerous regulations in the world and 3GPP cannot assume all the regulations are ready when we introduce some bands), considering the necessary time (typically almost a year or even longer) are needed to complete the work in 3GPP. |
| CATT | We support to approve the WI and start the work in Q2 2020. |
| Orange | The work can start in Q4 2020 |
| CBN | RAN to approve this WI in this meeting and finish the WI by end of Rel-17. The finishing time of the WI also depends on the available of regulatory requirement. |
| ZTE | We also support this WID from this RAN plenary meeting, maybe regulatory meeting schedule need to be taken into account. |
| Spreadtrum | We support to start the WI from this plenary. |
| Cisco | Agree with Charter that a timeline for this WID cannot be estimated as the regulatory framework completion date is still not available. |
| Deutsche Telekom | #Not many words:  We simply support approving this WI during this meeting and start work in 4Q2020.  #Thanks. |
| Ericsson | The WI can start from Q4 2020. If needed the target completion date can be extended depending on the progress and completion of the regulatory requirements. |
| China Unicom | We support to start WI in Q4 2020. |
| Lenovo, Motorola Mobility | We support to approve this WI in this plenary meeting and start it in Q4/2020. |
| CAICT | Agree with the proposed time line in RP-201744. |
| MTK | Support to start the work in Q4 2020. |
| CommScope | We agree with Apple, Broadcom, HPE and Cisco on that no LS response can be sent to RCC since the regulatory framework is not complete. |

**Moderator’s summary of first round discussions: see section 2.1**

### 2.3 Question 3: handling of LS from RCC countries (RP-201438)

How should RAN respond to the LS from RCC countries in RP-201438?

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| **Company** | **Comments** |
| Charter Communications, Inc | The response to the LS should be that once the regulatory framework is completed then 3GPP will consider inclusion of this band for standards work |
| Nokia | 3GPP is ready to start work on defining the mentioned band when the relevant regulatory requirements are available, and 3GPP encourages the RCC Commission on Spectrum and Satellite Orbits to complete such requirements as soon as possible in order to enable 3GPP to commence its work. |
| Apple | Referring to our previous comments, it is not entirely clear what kind of response we should provide to RCC. They indicated to 3GPP they “*approved their position in the context of preparations for WRC23 meeting*” and “*asked 3GPP to consider inclusion of 6425-7125MHz range into our specification*”. The best answer we can provide is that 3GPP adds new bands to specifications once we have enough information from the corresponding regulatory bodies. |
| Broadcom | Same as Apple. 3GPP should answer back that a discussion regarding a band definition can take place only after the regulatory framework is completed. |
| Hewlett Packard Enterpise | We concur with Apple and Broadcom that 3GPP could only consider their request once a regulatory framework has been established. |
| Facebook | If an LS response is necessary we agree with Charter that we can state in the LS that once the regulatory framework is completed then 3GPP will consider the inclusion of this band for standards work. |
| Huawei/HiSilicon | In addition to approving the WID, we support the idea of sending a response LS to RCC and possibly other relevant administrations. The contents of the response shall show positive spirit of 3GPP on the completion of the IMT licensed band definition for 6GHz in a timely manner. The response shall also encourage the relevant administrations to define the regulatory framework as soon as possible, in order for 3GPP to complete the corresponding band definition. |
| CBN | RAN should send reply LS to RCC, and attach the WID (if approved). RAN can ask RCC to clarify the corresponding regulatory requirement in the LS. |
| ZTE | We also support to send reply LS to RCC and other interested regulatory bodies to show the positive attitude on licensed operation on this 6GHz which will further facilitate RCC discussion and other regulatory bodies’s work plan. In addition, Rel-17 timeline might be good reference for other regulatory meeting schedule. |
| Spreadtrum | We support to send a replied LS to RCC and state the progress of this WI. |
| Cisco | RAN should only respond to LS once regulatory framework in complete. Agree with Apple response: 3GPP adds new bands to specifications once we have enough information from the corresponding regulatory bodies. |
| Deutsche Telekom | #Not many words:  We simply send and LS an indicate that the WI has been approved.  #Thanks. |
| Ericsson | 3GPP should inform RCC about the interest in 6GHz band for licensed operation triggered by RCC LS and about the outcome of 3GPP on this issue at the end of this meeting. We also agree with previous suggestions that the LS should request RCC to progress their work on the regulatory framework as soon as possible and communicate this information to 3GPP. |
| China Unicom | We support to send a response LS to RCC and state the discussion and progress of this WI. |
| Lenovo, Motorola Mobility | We support to send an LS to RCC. |
| Intel | The LS should state that 3GPP is ready to start work on defining the mentioned band when the relevant regulatory requirements are available and encourage RCC to provide more information on the timelines when regulatory requirements will be available. |
| MTK | We support to reply the LS to RRC. |
| CommScope | We agree with Apple, Broadcom, HPE and Cisco on that no LS response can be sent to RCC since the regulatory framework is not complete. |

**Moderator’s summary of first round discussions**

Responses were generally positive towards sending a response to RCC, highlighting the interest triggered by the LS, 3GPP’s positive intent to address RCC’s request in a timely manner, also pointing out dependency on their work on the regulatory framework. So it is proposed to continue the discussion on drafting a response. Part of the response may depend on the discussion on the WID, especially on aspects related to start time and end time of the work.

At least the following points seemed to be commonly supported for responding to RCC:

* 3GPP’s positive intent to address RCC’s request in a timely manner
* Complete specification of the band by 3GPP requires regulatory requirements
* 3GPP encourages the RCC Commission on Spectrum and Satellite Orbits to provide regulatory requirements as soon as possible, and inform 3GPP of the requirements when available
* Attach the WID (pending approval)

## 3 Round 2 of discussion

### 3.1 Clarification of requirements depending on regulations

In the second round of discussions, companies are invited to provide their views on the list of requirements that don’t depend on availability of regulations, and the list of requirements that depend on availability of regulations. As a starting point, the following lists are provided based on answers of the first round of discussions.

**Requirements that do not depend on availability of regulations:**

* System parameters (e.g. channel bandwidth)
* BS RF
  + BS output power accuracy related requirements
  + BS Tx signal quality
  + BS Tx dynamic range requirements
  + BS OBUE
  + BS ACLR
  + BS general spurious emissions
  + BS co-existence with other 3GPP bands
  + BS RX REFSENS
  + BS RX ACS
  + BS RX Dynamic range
  + BS RX blocking
  + BS RX ICS
  + BS RX IMD
* UE RF
  + UE power class
  + UE emission mask
  + UE general spurious emissions
  + UE ACLR
  + UE co-existence with other 3GPP bands
  + UE REFSENS
  + UE ACS
  + UE blocking

**Requirements that depend on availability of regulations:**

* Frequency range for each band
* Additional regional spurious emissions, additional emissions mask, and corresponding A-MPR if needed

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| **Company** | **Comments** |
| Charter Communications | First of all, regarding the % of companies supporting the WID and % of companies requiring regulatory framework to be completed. This is not the way we reach an agreement; otherwise, NR-U for 5 GHZ and 6 GHz would already be approved. The real issue is that a band plan cannot be developed without regulatory framework completion. I believe in [10] summary, there was a proposal that the moderator suggested which provides a possible direction or WF provided we can agree on the other proposals in the summary  With regards with the timeline, the clock does not start until regulatory framework is completed then a timeline can be established.  With regards to sending an LS to RCC, I would recommend to say something like 3GPP will kick off a WID to introduce the band plan once regulatory framework is completed  Finally, I do not believe that parsing out what requirements can be worked on without regulatory framework and which requirements can be delayed until regulatory framework is completed is not an effective approach nor it is a typical way to introduce a new band |
| Qualcomm | We disagree with the moderator’s representation of **Requirements that do not depend on availability of regulations**and we note here why. Indeed, ALL of the listed UE requirement are potentially impacted by uncertain **regulations**, except for general SEM and UE coexistence with other 3GPP bands.   * System parameters (e.g. channel bandwidth) -- some regulations allow certain channel bandwidths but not others * UE RF   + UE power class – Regulations certainly can impact power class. Most regulations have limits and constraints either on conducted power or EIRP   + UE emission mask – block edge masks and other such masks are commonly specified by regulators   + UE general spurious emissions   + UE ACLR – ACLR requirements have been imposed in the past by regulators   + UE co-existence with other 3GPP bands   + UE REFSENS – Since blocking requirements are subject to regulation and are therefore unknown, then the Rx filter requirements are also unknown. Even the band plan is unknown. Thus, without information on these filter requirements, we don’t know what the insertion loss is and therefore what the reference sensitivity is.   + UE ACS – ACS and blocker requirements have been specified by regulators and are more commonly a topic for regulation nowadays.   + UE blocking – ACS and blocker requirements have been specified by regulators and are more commonly a topic for regulation nowadays. |
| Hewlett Packard Enterprise | We concur with the comments of Charter Communications and Qualcomm above and join in their assessment that further work, including consideration fo the additional questions posed above, would be inappropriate and ineffective prior to the establishment of a regulatory framework. |
| OPPO | Not quite sure of the question here, in our understanding, the regulatory requirements are not the factor that will determine whether the new band can be introduced or not. Some of the requirements might be impacted by regulatory, however, that doesn’t mean 3GPP cannot work on requirement definition.  If there is regulatory requirements then they will be referred, if not then 3GPP can follow normal approach to define requirements. And later the regulatory requirements are ready, then 3GPP can revise the requirements, this is not new.  One example is the WRC-19 requirements for FR2 which has been newly defined, and RAN4 has discussed how to modify RAN4 requirements to align with that. Similar approach can be applied to this 6GHz band in our view.  Therefore, we don’t see the dependency of defining a band and the existence of regulatory requirements. |
| ZTE | Similar situation existed when NR-U 6GHz was introduced, regulatory framework are also under discussion in US and EU, therefore we did have precedent case before even for the same frequency range. e.g. we start to discuss NR-U 6GHz band definition in 2019 and however FCC NPRM is not expected to be closed in the first quarter of 2020. |
| Broadcom | As we answered in the 1st round we believe that this discussion is pointless without a clear definition of the band. As few companies pointed out the assessment of future work can be done only after the requirements for the band are clearly defined and understood based on an approved regulatory framework. A SI phase may also be required in this case. |
| Huawei, HiSilicon | In our view, most of the BS and UE requirements for an operating band can be defined in a generic way, which are not close relevant to the regulatory requirements.  For system parameter, though certain channel bandwidth may not be used for some regions due to possible regional regulations, the CBW should be defined flexibly enough to accommodate all applicable scenarios.  Usually ACLR, ACS and blocking requirements are derived based on co-existence simulation for adjacent channels with the IMT services for two operators, which are not dependent on the regulations.  Based on experience of defining 3GPP bands, if there are additional protection limits specified by regulations, the common practice is to define additional spurious emissions/emission mask and consider A-MPR to comply with these regulatory requirements. An example was mentioned by OPPO, i.e. WRC-19 requirements what we are discussing now in RAN4. We also think that similar approach can be used for 6GHz licensed band as well.  Besides the additional regulatory requirements, most of the requirements can follow the generic way adopted by 3GPP for other bands.  We continue support approving a WID at this RAN plenary meeting and starting the WI from 2020Q4 with requirements that do not depend on the availability of regulations. But we also recognize that completion depends on regulation availability |
| Cisco | We don't understand the point of this exercise. While it might be true that some aspects may be independent of regulation, unless there is a clear regulatory framework in place, there is no point in using RAN4's precious time in "preparing for homework" when it is not clear that the assignment will be provided, when it will be provided, and what the parameters in the homework assignment will be. Given the overload in RAN4, a constructive suggestion is for interested companies to "prepare for this homework" **offline** and then when the regulatory requirements are available bring and a work item has been agreed, bring it to 3GPP. |
| Telia Company | Telia Company supports approving the WI. We are of the view that 3GPP work on 6 GHz requirements and parameters would give clear indication on the demand for licensed operation and support the work on finalizing the regulation. Our interest is primarily 6425-7125 MHz |
| Intel | In our view the following RF requirements may be impacted by the regulatory requirements:   * System parameters: Band plan, Channel raster, Channel BW * BS RF   + Unwanted Emissions (BS OBUE, BS ACLR, BS general spurious emissions)   + BS coexistence with other 3GPP bands * UE RF   + Maximum output power and UE power class   + Unwanted Emissions (UE emission mask, UE general spurious emissions, UE ACLR)   + UE coexistence with other 3GPP bands   Depending on the actual regulatory decisions there may or may not be impact on the eventual requirements and it is difficult to predict unless the regulatory decisions are available.  Therefore, our view is that the regulatory requirements are indeed required for the RF band definition in 3GPP and without such information it will be challenging to progress the work. |
| China Telecom | We support approving this WI at this meeting. In our understanding, many requirements for 6GHz licensed band (at least channel bandwidth, BS RX reference sensitivity, UE REFSENS, etc) would be independent of regulation, and only part of RF requirement depends on the completion of regulation. |
| CATT | We don’t quite understand why there are so many concerns on approving this WI for licensed scenario. We have so many precedents on approve WI before regulation is available. Given the strong demand and interests from industry for licensed scenarios, it is natural to have such work done in 3GPP as early as possible. As summarized by the moderator, a clear majority of the RF requirements are independent of regulation. We can work on these requirements at first during the work phase. As long as we get the regulatory requirements at an proper time of point during the WI, we can complete the work on time. The regulatory requirement only impacts the completion of the WI. This is also what is happening for 6GHz for unlicensed scenarios.  We see no concrete reasons to prevent the approval of this WI. We support to approve this WI in this meeting. |
| vivo | Theoretically, many UE requirements can be impacted by diverse regulatory requirements. However, during the introduction of new bands, most of the requirements were actually quite “stable” and “generic”. e.g. There is only one set of ACLR / SEM /ACS, and only quite limited set of blocking requirements. A-MPR is often impacted by regulation and band-specific.  In addition, fine tuning of requirements based on regulatory update seems have some precedencies, even if not deemed frequent. |
| CMCC | We support to approve the 6GHz licensed band in this meeting.  As we commented in 1st round, we don’t think that 3GPP should define the new band only after the completion of regulatory requirements. As also commented by OPPO and Huawei, RAN4 modify the requirements to align with the newly defined WRC-19 requirements later after the band was already introduced in 3GPP.  Also, for many generic requirements that are not impacted regulatory requirements, including system parameter, ACLR, ACS, REFSENS, blocking, power class, co-existence with other 3GPP bands. Moderator provides good summary on the dependency of regulations on the requirements. Of course, companies may still argue that even though usually these requirements do not depend on regulations, theoretically, it cannot totally preclude the regulation impacts. However, we don’t think use argument of these unusual cases to object other regions’ demand on certain licensed band is a right approach.  We understand different regions and countries have different flavours on licensed or unlicensed on 6GHz. And believe 3GPP should treat the demands of each region neutrally. |
| CAICT | According to first-round discussion, several companies mentioned that generic RF requirements can be defined before regulatory requirements are available. Once we have a list of general requirements, which do not depend on the availability of regulation, then the work can be started. We support RAN to approve a WID that can start working on general requirements from 2020Q4 |
| Apple | We agree with the views expressed by Charter, Qualcomm, Broadcom and other companies who have clearly indicated that it is not procedurally appropriate to initiate a new WI in a situation when everybody is aware of the fact that the regulatory discussions are still ongoing. Based on that we should wait for those discussion to complete before taking next steps in 3GPP as they impact final parameters that 3GPP will take as an input for the technical work.  See our comments below on the LS. |
| ORANGE | We agree with Huawei that a number of performance requirements can be addressed in a generic manner. We support the approval of this WI at this plenary. |
| MTK | We do not think the whole RAN4 discussion has to wait for the readiness of regulation requirements. Even for the REFSNS pointed out by QC, effective NF(IL + module + transceiver’s NF) in RAN4 is 9~13dB for FR1 L/M/H bands including of licensed and unlicensed bands, to have worst IL (6dB) as the assumption for covering any architecture can be studied as the first step. It is fine to start some discussion early, although the final values can be confirmed after regulation gets clear. |
| CBN | It is important to understand which requirements do not depend on the availability of regulations and which requirements do depend on the regulations. With such understanding, RAN can approve the WID (revised if needed) and start working on those without dependency on the availability of regulations. |
| Lenovo | As commented by many companies, Rel-16 NR-U standardization work is started before the completion of regulatory requirements in US and EU. We think the similar experience can be shared for 6GHz licensed band. Additionally, most BS and UE RF requirements can be defined in a generic manner. The related work can be started at the first stage and fine-tuned after the completion of regulation requirements. |
| Nokia, Nokia Shanghai Bell | 1. Although we fully support defining these bands as soon as complete regulatory requirements are available, there is clearly not consensus to approve a WI at this stage as the regulatory requirements are not available for any region. 2. It is unclear to us how the above list of “requirements that do not depend on availability of regulations” was compiled:  * System parameters (e.g. channel bandwidth) – it is necessary to know the band plan in order to agree to system parameters, e.g. channel raster * BS RF   + BS OBUE – depends on regulations (we may need additional OBUE requirement; considered BS power classes are not clear)   + BS ACLR – depends on regulations (since considered BS power classes are not clear)   + BS general spurious emissions – depends on regulations (we may need additional spurious emissions requirement; considered BS power classes are not clear)   + BS co-existence with other 3GPP bands – depends on regulations (since considered BS power classes are not clear)   + BS RX REFSENS - depends on regulations (since considered BS power classes are not clear)   + BS RX ACS - depends on regulations (since considered BS power classes are not clear)   + BS RX blocking – depends on regulations (we may need additional blocking requirement; considered BS power classes are not clear) * UE RF   + UE power class – depends on regulations   + UE emission mask – depends on regulations   + UE general spurious emissions – depends on regulations (we may need additional spurious emissions requirement; considered power class is not clear)   + UE ACLR – depends on regulations (since considered power class is not clear)   + UE co-existence with other 3GPP bands – depends on regulations (since considered power class is not clear)   + UE REFSENS - depends on regulations (since considered power class is not clear)   + UE ACS - depends on regulations (since considered power class is not clear)   + UE blocking – depends on regulations (we may need additional blocking requirement; considered power class is not clear)  1. It is not good practice for 3GPP to start spectrum WIs in RAN4 in order to give messages; we should start spectrum WIs when we are ready and able to do the work. We send LSs to give messages. We are very happy to send an LS to the RCC and even to other regulators also, to encourage them to provide the necessary framework as soon as possible. |
| China Unicom | We share the views with other operators that 6GHz is critical for the 5G NR commercial deployment in licensed band. The regulatory framework only impacts on the completion date of the WI, while the generic RF requirements are independent of regulation requirements, i.e. System parameter, ACLR, ACS, REFSENS, Blocking, Power class, Co-existence with other 3GPP bands. We fully understand that the spectrum for 6GHz might be treated licensed or unlicensed in different regions or countries, and we believe that 3GPP should treat all the requirements and market demands equally.  We support to approve the WI in this meeting and start the work item in Q4 2020. |
| Ericsson | We agree with the list of requirements provided by the moderator. RAN4 can start with the generic requirements and regulatory ones can be added towards the end if the WI or as soon as they are ready. |
| Spreadtrum | We support to approve the WI in this meeting since the strong need from WRC and other societies and starting this WI can help more countries to deploy 5G NR on more available bands in an early stage. The requirement lists that do not depend/depend on availability of regulations are OK for us. |
| Xiaomi | From the first-round discussion, it seems there are clear demands from industry according to the justification part and the feedbacks from some operators, and considering R17 WIDs will be packeted to be agreed in this meeting, there may be no time to wait the completion of all regular requirements. Before that, we may still have some work to do for the requirements that don’t depend on availability of regulations. |
| Facebook | From the first round of email discussion, it is clear that there is no consensus to approve this WI. We want to restate the need for regulatory requirements as we always does in starting the work in 3GPP. |

### 3.2 Draft LS response

A draft LS text is provided below for review (noting that some parts depend on further discussion in section 3.1).

3GPP TSG RAN would like to thank the RCC Commission on Spectrum and Satellite Orbits for their liaison inviting 3GPP TSG RAN to consider the inclusion of the 6425-7125 MHz frequency band in the 3GPP specification for 5G-NR/IMT-2020 systems. 3GPP TSG RAN would like to assure the RCC Commission on Spectrum and Satellite Orbits of 3GPP TSG RAN’s intent to address the request and include the band in the 3GPP specification as soon as regulatory requirements are available. To this end, 3GPP TSG RAN would like to invite the RCC Commission on Spectrum and Satellite Orbits to provide regulatory requirements as soon as possible so that 3GPP TSG RAN can complete the band definition for inclusion in the 3GPP specifications.

[Place holder depending on the outcome from the second phase email discussion, e.g. which aspects of the RAN4 work depends on regulatory requirements, and which aspects don’t, also information about potential 3GPP work plan for the 6GHz IMT licensed band(s).]

Action to the RCC Commission on Spectrum and Satellite Orbits: 3GPP TSG RAN respectfully invites the RCC Commission on Spectrum and Satellite Orbits to provide the regulatory requirements that will allow 3GPP to complete the inclusion of the 6425-7125 MHz frequency band in the 3GPP specifications for 5G-NR/IMT-2020 systems.

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| **Company** | **Comments** |
| Charter Communications | We do not agree in this draft LS |
| Hewlett Packard Enterprise | We would not object to a response acknowledging the LS and indicating that the request will be considered once a regulatory framework has been established. But we do not agree to this draft LS. |
| Broadcom | It is OK to send a reply LS. However, we do not agree with the proposed draft LS. 3GPP should only answer back that a discussion regarding a band definition can take place only after the regulatory framework is completed. |
| Huawei, HiSilicon | We support sending out the LS to RCC. If any regulatory requirements are provided by RCC or other regulatory bodies on 6GHz band(s), it would be helpful to complete the regulatory related RF requirements, i.e. additional spurious emissions/SEM requirements and corresponding A-MPR if needed. |
| Cisco | Draft LS response should be simple. Suggested response:  3GPP TSG RAN would like to thank the RCC Commission on Spectrum and Satellite Orbits for their liaison inviting 3GPP TSG RAN to consider the inclusion of the 6425-7125 MHz frequency band in the 3GPP specification for 5G-NR/IMT-2020 systems.  3GPP TSG RAN requests RCC Commission on Spectrum and Satellite Orbits that when the regulatory framework is complete to inform 3GPP TSG RAN about it such 3GPP can take the next steps. |
| Telia Company | Telia Company support sending out the LS to RCC and agrees the content of current draft LS content. |
| Intel | As commented in the first round the LS should state that 3GPP is ready to start work on defining the mentioned band when the relevant regulatory requirements are available. We can also request RCC to provide more information on the timelines when regulatory requirements will be available.  Also, we are not sure if this is a good idea to include the list of RAN4 requirements which depend on regulatory requirements. |
| CATT | We need to send the LS to RCC to let them know the industry interests and progress the regulation as soon as possible. |
| Apple | Echoing Cisco and Broadcom comments, 3GPP should a provide a neutral response as presented below:  3GPP TSG RAN would like to thank the RCC Commission on Spectrum and Satellite Orbits for their liaison inviting 3GPP TSG RAN to consider the inclusion of the 6425-7125 MHz frequency band in the 3GPP specification for 5G-NR/IMT-2020 systems. 3GPP TSG RAN can commence the corresponding technical work when the regulatory framework is complete. |
| ORANGE | Orange supports sending out the LS. |
| CBN | As we indicated in the first-round discussion, we are in a supportive position of the LS. The draft LS looks agreeable to us. |
| Lenovo | The LS is fine with us. |
| Nokia, Nokia Shanghai Bell | We support sending an LS; the first paragraph is sufficient, however. |
| China Unicom | We agree with the wording in the draft LS, and we should send it to RCC in this meeting. |
| Ericsson | We support the draft of the LS provided by the moderator. It is important to request RCC to provide input on the regulatory requirements, |
| Spreadtrum | We support to send a replied LS to RCC and state the progress of this WI. |
| Facebook | We should state in the LS that only after the regulatory framework is completed then 3GPP will consider the inclusion of this band for standards work. |

## 4 Intermediate Summary

## 5 Contacts

Please provide a company contact that the email discussion moderator can contact if required.

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| --- | --- |
| **Company** | **Contact name and email** |
| Nokia | Matthew Baker <matthew.baker@nokia.com> |
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