IEEE P802.11
Wireless LANs

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|

|  |
| --- |
| CR SRG and SRP |
| Date: 2017-12-13 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Matthew Fischer | Broadcom |  |  | Matthew.fischer@broadcom.com |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

 |

Abstract

Comment resolution with proposed changes to TGax D2.0 for CIDs from LB230 related to the SRG and SRP features.

The CID list is:

Definition CIDs:

13687, 13690, 11814, 12346, 11536, 11822, 13688, 11823, 12331, 13130, 11703, 11815, 11824, 12024, 13129, 13531, 13802, 13856, 13532, 13689, 11744, 14101

Spatial Reuse Parameter Set IE

12429, 11548, 11256, 11549, 13849, 11550, 12232

SRG determination

14215, 13884, 13057, 13824, 12458, 13885, 13886

SR Behavior overview

12716, 11360, 11357, 13009

SRP behaviour

12190, 11782, 13157, 13557, 13936, 12071, 11783, 13558, 11816, 12192, 13560, 13937, 14291, 11817, 12253, 13832, 13561, 11820, 12254, 13562, 13833, 11560, 11819, 13563, 12075, 11825, 12261, 12258, 12259, 11826, 11561, 13564, 13158, 11827, 12193, 14120, 14300, 12074, 14121

SRP and OBSS\_PD interaction

12195, 11562, 12196, 12544, 12198, 12200, 12202, 12543, 12204

SPATIAL\_REUSE parameter of TXVECTOR

12545, 12546, 11932, 12269, 11868, 12271, 14308, 12547, 13945, 11933, 11934, 13946, 12549, 12290, 13011

11935, 11936, 12273, 12291, 14310, 14311

The proposed changes on this document are based on TGax Draft 2.0.

**REVISION NOTES:**

**R0**:

initial

**R1**:

CID 13884, 13886 – original resolution modified text to require that the AP shall use the same information for SRG PPDU identification that it has transmitted to other STAs, however, it is noted that an AP may send different information for SRG to different STA, and therefore, the AP may use any set of information, possibly untransmitted, to determine SRG PPDUs, so the original proposed changes for these comments has been modified to allow the AP complete freedom in determining SRG PPDUs

Updated doc references in resolutions

**END OF REVISION NOTES**

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGax Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGax Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGax Editor: Editing instructions preceded by “TGax Editor” are instructions to the TGax editor to modify existing material in the TGax draft. As a result of adopting the changes, the TGax editor will execute the instructions rather than copy them to the TGax Draft.***

**CIDs**

Note that the CID set is determined from those that are assigned to Matthew Fischer.

Due to requests by other members to volunteer, some reassignment of CIDs has unofficially occurred. The result of that unofficial reassignment is reflected within this document as follows:

CIDs with GRAY background are covered by Laurent in a separate document 11-17-LLLLrY.

CIDs with PINK background are covered by Yuichi in 11-17-YYYYrY

CIDs with GREEN background are covered by Thomas in a separate document 11-17-TTTTrY

CIDs with PURPLE background are covered by Kaiying in a separate document 11-17-KKKKrY

CIDs with ORANGE background are covered by NOBODY in a separate document 11-17-NNNNrY

**Definition CIDs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **13687** | Tomoko Adachi | 3.2 |  | The definition of SR itself should be included. | Add a definition of SR in clause 3.2. | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13687 |
| **13690** | Tomoko Adachi | 3.2 |  | The definition of SRP-based SR itself should be included. | Add a definition of SRP-based SR in clause 3.2. | Reject – clause 3 is for the definition of terms that are used later in the document, and there is no term lacking a definition that the commenter has identified. The definition of the function of SRP based SR is inherent in the subclauses that describe its operation. |
| **11814** | Guoqing Li | 3.2 | 33.11 | DSRP\_PPDU and SRP PPDU are defined interchangably. It's better to use one terminology throughout the spec | Use only one of the terminlogy througout the spec | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11814, commenter to forgive the authors of the relevant subclauses, as the original proposal which added these subclauses included additional functionality beyond DSRP\_PPDU and those additional PPDUs and functionality included common functionality which used the generic SRP\_PPDU term to refer to the collection of all xSRP\_PPDU types. The final proposal adopted for SRP included only one such type of SRP PPDU, but the language retained its potential use for >1 type by keeping both terms. |
| **12346** | Liwen Chu | 3.2 | 33.11 | Add another spatial reuse value SRP\_AND\_NON-SRG-OBSS-PD\_PROHIBITED | As in comment | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12346 |
| **11536** | Dorothy Stanley | 3.2 | 34.27 | What is the difference between definitions of SRP PPDU and DSRP PPDU? | They seem identical, so just use one. | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11536. Commenter should read the resolution to CID 11814 for further explanation. |
| **11822** | Guoqing Li | 3 | 34.50 | Line 50 and 54 defined the same thing. Please remove one of them | Remove one of the definitions | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11822 |
| **13688** | Tomoko Adachi | 3.2 | 34.50 | There are SR PPDU and SR\_PPDU. Are they different or same? The expression is not clear enough that a reader cannot judge whether it is a typo or a not. | Delete either of the term if they are the same. Change either of the term to be more distinguishable it they are different. | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13688 |
| **11823** | Guoqing Li | 3 | 34.54 | Line 50 and 54 defined the same thing. Please remove one of them | Remove one of the definitions | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11823 |
| **12331** | Lei Huang | 3.2 | 34.54 | the definition on SR\_PPDU is redundant since it has been defined in P34L50. please delete it | as in the comment | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12331 |
| **13130** | Po-Kai Huang | 3.2 | 34.54 | The definition of SR PPDU is limited to SRP operation. Suggest to follow the definition of OBSS PD SR PPDU to define it as SRP SR PPDU. | Change SR\_PPDU to SRP SR PPDU. Spell out what SRP stands for. | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13130 |
| **11703** | Evgeny Khorov | 3.2 | 34.57 | SRP PPDU: a PPDU that is a DSRP\_PPDU | Improve unclear definition | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11703 |
| **11815** | Guoqing Li | 3.2 | 34.57 | DSRP\_PPDU and SRP PPDU are defined interchangably. It's better to use one terminology throughout the spec | Use only one of the terminlogy througout the spec | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11815 |
| **11824** | Guoqing Li | 3 | 34.57 | If SRP PPDU is DSRP\_PPDU, the spec should just use one terminlolgy | Use only one of the terminologies (either SRP PPDU or DSRP\_PPDU) throughput the spec | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11824 |
| **12024** | James Yee | 3.2 | 34.57 | It is counter intuitive to say SRP PPDU and Delayed SRP PPDU are the same. If this is the case why we need both temrs? | Please clarify. | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12024. Commenter should read the resolution to CID 11814 for further explanation. |
| **13129** | Po-Kai Huang | 3.2 | 34.57 | It seems that the defintiion for SRP PPDU is redundant because it is actually a DSRP\_PPDU, which is already defined | Remove the definition of SRP PPDU. | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13129. Commenter should read the resolution to CID 11814 for further explanation. |
| **13531** | SUNGEUN LEE | 3.2 | 34.57 | Definition is dead-end. There is no description what DSRP\_PPDU is for SRP PPDU definition. In additoin, underscore should be used on the definition for consistency. | change to 'SRP\_PPDU' with underscore and provide the clear description and definition what SRP\_PPDU is | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13531. Commenter should read the resolution to CID 11814 for further explanation. |
| **13802** | Yasuhiko Inoue | 3.2 | 34.57 | "SRP PPDU: a PPDU that is a DSRP\_PPDU"We do not need more than one term to mean exactly the same thing. Rather than defing two terms, we should use either one term throughout the document. | Current definition for "SR\_PPDU" is more appropriate for "SRP PPDU" since it is a PPDU transmitted during an SRP opportunity by an HE STA when SRP conditions for SRPbasedspatial reuse operation are satisfied which does not includes PPDU sent by OBSS\_PD-based SR. | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13802. Commenter should read the resolution to CID 11814 for further explanation. |
| **13856** | Yongho Seok | 3.2 | 34.57 | "SRP PPDU: a PPDU that is a DSRP\_PPDU"An SRP PPDU is equal to a DSRP\_PPDU. So, a definition of an SRP PPDU is not needed. | Replace "SRP PPDU" with "DSRP\_PPDU" throughout D2.0. And remove the definition of the SRP PPDU. | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13856. Commenter should read the resolution to CID 11814 for further explanation. |
| **13532** | SUNGEUN LEE | 3.2 | 34.58 | Introduce the definition of DSRP\_PPDU | Introduce the definition of 'DSRP\_PPDU' and describe what D represents, i.e., Delayed | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13532. Commenter should read the resolution to CID 11814 for further explanation. |
| **13689** | Tomoko Adachi | 3.2 | 34.58 | "SRP PPDU: a PPDU that is a DSRP\_PPDU" Then there is no need to define SRP PPDU but just use DSRP\_PPDU.Also, note that there is no period at the end. | Delete the definition or add further explanation why it needs to be defined. | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13689. Commenter should read the resolution to CID 11814 for further explanation. |
| **11744** | GEORGE CHERIAN | 3.4 | 35.00 | Add OBSSPD to the 3.4 Abbreviations and acronyms, or change OBSSPD to OBSS-PD | As in the comment | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11744. |
| **14101** | Yuichi Morioka | 27.2.3 | 222.59 | What is the definition of a "non-SRG frame"? All frames that are not SRG frame? | Add definition of a non-SRG frame. Page 223 line 13 "Otherwise, the PPDU is not..." is probably the right place to do so. | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 14101. |

**Spatial Reuse Parameter Set IE CIDs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **12429** | Liwen Chu | 9.4.2.243 | 156.43 | The definition of Non-SRG OBSS\_PD SR Disallowed is just used for Tx control. However it seems the field is used for setting HE SIG-A also in clause 27. | make two places consistent. | Revise – TGax editor to make changes as shown in 11-18/0026r1 and in 11-17/LLLLrY that are marked with CID 12429 |
| **11548** | Dorothy Stanley | 9.4.2.243 | 156.48 | Regarding, "The Spatial Reuse Parameter Set element provides information needed by STAs when performing OBSS\_PD-based spatial reuse", what about SRP Disallowed in the SR Control Field? I do not believe it applies to OBSS\_PD-based SR. | as in comment | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11548 |
| **12044** | Jarkko Kneckt | 9.4.2.243 | 156.56 | The SRG OBSS PD Min Offset can allow associated STAs to transmit with full transmission power even when they detect WLAN signal from an SRG BSS at -62 dBm energy. The spatial reuse is targetted to organise higher transmission density by lowering the transmission power when the sensitivity requirement is relaxed. An ill behaving AP can get benefit by misconfiguring SRG OBSS PD MIN value. In this case the non-AP STAs may transmit with full transmission power during the transmissions of the SRG OBSSs. The 802.11 should ensure fairness between STAs and not allow such behaviour. In worst case, this operation may be used against the WLAN, for instance It may be difficult to explain to the FCC and other regulators why WLAN allows such interfering transmissions and why it cannot control WLAN BSSs and STAs. Lack of control may prevent WLAN use in new spectrum and cause changes in the current regulation. | Please delete all instances of the SRG OBSS PD Min Offset and its use in the spec. Please allow only to control the OBSS PD Max Offset. | See 11-17-TTTTrY |
| **11256** | Albert Petrick | 9.4.2.243 | 157.09 | In Figure 9-589dd-(SR Control field format) the Reserved field shows bits (B5-57) as Reserved. Text is missing of logical default setting. | In the text define the default value of the (B3-B7) "Reserved. Set to 1." | Reject – quite some time ago, the 802.11 WG agreed that there needs to be only one instance of the description of all fields within clause 9 that are labeled as “reserved” in order to avoid unnecessary clutter. That one instance is found in 9.2.2 Conventions. |
| **11549** | Dorothy Stanley | 9.4.2.243 | 157.25 | what is "Non-OBSS\_PD SR Disallowed"? | as in comment | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11549 |
| **13849** | Yonggang Fang | 9.4.2.243 | 157.35 | What is the definition of Spatial Reuse Group (SRG)? It would be better to provide the definition or explanation. |  | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13849 |
| **11550** | Dorothy Stanley | 9.4.2.243 | 157.44 | what are the values of HESIGA\_Spatial\_reuse\_value15\_allowed? | as in comment | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11550 |
| **12232** | kaiying Lv | 9.4.2.243 | 157.46 | Change "SRP\_AND\_NON-SRG-OBSS-PD\_PROHIBITED " to "SRP\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED " | as comment | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12232 |

**SRG Determination CIDs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **14215** | Yunbo Li | 27.2.3 | 222.59 | Please add the purpose and scenario to introduce SRG. | Please add the purpose and scenario to introduce SRG. | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 14215 |
| **13884** | Yongho Seok | 27.2.3 | 222.61 | "An HE STA that has received a Spatial Reuse Parameter Set element from its associated AP with a value of 1 in the SRG Information Present subfield shall use information provided in the Spatial Reuse Parameter Set element to identify BSSs that are members of the STA's SRG to determine whether or not a received inter-BSS PPDU is an SRG PPDU."An HE AP STA that has transmitted a Spatial Reuse Parameter Set element is missed. | Change as the following:"An HE STA that has transmitted or received a Spatial Reuse Parameter Set element to/from its BSS with a value of 1 in the SRG Information Present subfield shall use information provided in the Spatial Reuse Parameter Set element to identify BSSs that are members of the STA's SRG to determine whether or not a received inter-BSS PPDU is an SRG PPDU." | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13884 |
| **13057** | Osama Aboulmagd | 27.2.3 | 223.01 | Since the BSS\_COLOR value is not unique, what will happen if the same values is used by two or more BSSs and the BSS-COLOR bit map is set to 0 by some BSSs and to 1 by the rest? Would the non HE STA continuously flip between 0 and 1? Shouldn't there be a condition to handle this situation? | as in comment. Perhaps using BSSID in the MAC header. | Reject – the bitmap is set by the AP or by an entity that is managing the AP. The bitmap is not likely to be modified with every reception of a Beacon but is expected to have a pseudo-static value and in the case when an OBSS that is not intended to be part of the SRG is identified, the response would likely be to simply exclude the corresponding color from the bitmap, even if a BSS that is part of the SRG is using the same color. Certainly if some amount of time passes without the detection of the non-intended BSS, it is possible for the manager to set the bit in the bitmap again, but the timeout for the detection event is likely to be long, and if a flipping of a bit does occur it would have a period equal to at least that timeout value, probably on the order of seconds. |
| **13824** | Yasuhiko Inoue | 27.2.3 | 223.01 | "A received HE PPDU that is an inter-BSS PPDU is an SRG PPDU if the bit in the SRG BSS Color Bitmap field which corresponds to the numerical value of the BSS\_COLOR parameter of the RXVECTOR is set to 1."The above text should be refrased, e.g."A received HE PPDU that is an inter-BSS PPDU is an SRG PPDU if the SRG BSS Color Bitmap field contains the same numerical value of the BSS\_COLOR parameter of the RXVECTOR." | As in the comment, | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13824 |
| **12458** | Liwen Chu | 27.2.3 | 223.08 | So a frame with 2 address fields in MAC header can't be identified as SRG PPDU. The decision of two-address frame may be added like inter-BSS/intra-BSS PDU. | As in comment | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12458 |
| **13885** | Yongho Seok | 27.2.3 | 223.08 | "A received PPDU that is an inter-BSS PPDU is an SRG PPDU if BSSID information from an MPDU of the PPDU is correctly received and the bit in the SRG Partial BSSID Bitmap field which corresponds to the numerical value of BSSID[39:44] is set to 1."Please specify how to determine the BSSID information from the received MPDU.For example, When the MPDU is a Data or Management frame, the BSSID information is obtained from the BSSID field.When the MPDU is a Control frame, the BSSID information is obtained from the TA field if the RA field is set to a broadcast address.When the MPDU is a Control frame, the BSSID information is obtained from the RA field if the RXVECTOR parameter UPLINK\_FLAG is present and set to 1.When the MPDU is a Control frame having the TA field, the BSSID information is obtained from the TA field if the RXVECTOR parameter UPLINK\_FLAG is present and set to 0.When the MPDU is a Control frame having the TA field, the BSSID information is obtained from the TA field if the RXVECTOR parameter GROUP\_ID is present and set to 63. | Insert the following sentences:"When the MPDU is a Data or Management frame, the BSSID information is obtained from the BSSID field.When the MPDU is a Control frame, the BSSID information is obtained from the TA field if the RA field is set to a broadcast address.When the MPDU is a Control frame, the BSSID information is obtained from the RA field if the RXVECTOR parameter UPLINK\_FLAG is present and set to 1.When the MPDU is a Control frame having the TA field, the BSSID information is obtained from the TA field if the RXVECTOR parameter UPLINK\_FLAG is present and set to 0.When the MPDU is a Control frame having the TA field, the BSSID information is obtained from the TA field if the RXVECTOR parameter GROUP\_ID is present and set to 63." | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13885, noting to the commenter that only a portion of what is requested is valid, as the value of group\_id 63 is also used for TDLS and therefore cannot be used as a definitive determinant. The uplink == 0 cases are similar. The broadcast RA cases do not seem worth bothering with. The uplink ==1 cases are valid and now included.  |
| **13886** | Yongho Seok | 27.2.3 | 223.13 | "An HE STA that has not received a Spatial Reuse Parameter Set element from its associated AP with a value of 1 in the SRG Information Present subfield shall not classify any received PPDUs as an SRG PPDU."An HE AP STA that has transmitted a Spatial Reuse Parameter Set element is missed. | Change as the following:"An HE STA that has not transmitted and not received a Spatial Reuse Parameter Set element to/from its BSS with a value of 1 in the SRG Information Present subfield shall not classify any received PPDUs as an SRG PPDU." | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13886 |

**SR Behavior Overview CIDs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **12716** | Mark RISON | 27.9 |  | "legacy portion of the PPDU" is not a defined concept, nor is "legacy portion of the DSRP\_PPDU" | Define these portions as the L-STF, L-LTF and L-SIG fields | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12716 |
| **11360** | Andrew Myles | 27.9 | 289.00 | 802.11ax includes two spatial resue methods. Both methods are relatively complex and there are doubts about how well they work. It appears both are included because of these doubts.. Presumably the hope is that one mechanism does actually work.However, standards are supposed to be generally about standardising proven mechanisms (preferably one to reduce complexity and risk) or mechanims that are known to work rather than standardising experiments. | The 802.11ax draft should be modified to remove at least one of the SR mechanisms. The TG should be confident that the remaiing mechanism actually works. If not then both mechanisms shoukd be removed. | Reject – There is no doubt that the SRP SR mechanism is effective when an opportunity to use it is identified. The SRP mechanism relies on measured information that might be subject to some error, but engineering always must include margin for error.The OBSS PD SR mechanism has been proven, in various situations, through simulation, to be effective in producing good outcomes. The standard of quality of the evidence presented in support of the OBSS PD SR mechanism is no different than the standard that has been applied to various other features and functions which have been included in previously approved 802.11 standard amendments, and there are other features that have been included in the past that have been included with a much lower bar of quality of evidence. |
| **11357** | Alfred Asterjadhi | 27.9 | 289.54 | It is still difficult to understand what values of the SIG-A related to which of the features. Similar for the terminologies, in certain cases they are not consistent. SRP, SR, DSRP, etc. Suggest to revew carefully so that there is no inconsistencies. Similar observation for the normative behavior. Not all cases are covered from the AP side and also in some cases from the STA side. | As in comment. | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11357, with a note to the commenter that other changes presented in 11-18/0026r1 in response to other CIDs provide additional improvements in clarity and consistency beyond those marked with CID 11357. Any additional changes needed to satisfy the commenter would require more specificity accompanying the otherwise rather general comment. |
| **13009** | Massinissa Lalam | 27.9 | 289.54 | I don't see any technical reason to support two versions of the spatial reuse (OBSS\_PD and SRP), while it is not even clear if one version A58brings any gain (especially in heterogeneous deployment with legacy devices present in the network). At least add some pros and cons for each of the two methods and why one should apply one instead of the other. | As in comment | Reject – There is no doubt that the SRP SR mechanism is effective when an opportunity to use it is identified. The SRP mechanism relies on measured information which requires additional complexity within an implementation and in this case, as if often the case within 802.11, the choice between complexity and performance is left to the implementer.A similar argument is made for the OBSS PD SR mechanism, which likely has a simpler implementation, but is also likely to have a less exacting outcome, hence matching the classic engineering tradeoff between performance and accuracy vs complexity.Traditionally, the choices among optional functions are presented in the standard without education or hints or suggestions as to which tradeoff to make in an implementation because every implementation could be targeted for a different application and/or scenario and the authors of the amendment do not feel omniscient enough to be able to anticipate all of the valid futures that might arise, therefore preferring to leave the actual embodiment of implementations of the future to be flexible in their nature in order to deal with whatever future finally does come to us, be it the catastrophic explosion of a super volcano that fills the skies with dust and covers the earth with a suffocating layer of ash or an invasion of highly intelligent, sophisticated and deadly aliens from space or a cost efficient and performance competitive LTE-U system. |

**SR Behavior General CIDs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **12081** | Jinjing Jiang | 27.9.1 | 289.59 | Is there a mode on SRP\_AND\_SRG\_OBSS\_PD\_PROHIBITED? | Please clarify | See 11-17-LLLLrY |
| **11770** | Graham Smith | 27.9.1 | 290.01 | What a long winded way to describe a possible way to find out the Color of neighboring APs and of APs that are hidden form the originating AP. I can see that the AP might like to chose a color that none of its STAs sees but in this case the STA is straying from the network area. If you want to do this simply say words to the effect that "an AP may use a Beacon request to establish the color of neighnboring networks." | Delete P290 L1 to L16. | See 11-17-LLLLrY |
| **11771** | Graham Smith | 27.9.1 | 290.21 | "A non-AP HE STA that performs spatial reuse operation shall respond to a Beacon request from its associated AP with a Beacon report as described in 11.11 (Radio measurement procedures)." In the sentence aboive this t says that an HE AP may use the Beacon report for spatial reuse,, but here it says that a non-AP HE STA shall respond to a Beacon request. Hence a STA must support it, but an AP need not. Why can't the AP simply use a STA that does support it? Delete | Delete cited text | See 11-17-LLLLrY |
| **13151** | Qi Xue | 27.9.1 | 290.21 | Change this to a 'should' requirement:"A non-AP HE STA that performs spatial reuse operation shall respond to a Beacon request..." | As in the comment | See 11-17-LLLLrY |
| **14113** | Yuichi Morioka | 27.9.1 | 290.22 | The spec should allow the option for HE STAs to report the utilization of the medium where the HE STAs can not hear the beacon from the OBSS AP. | The commenter is willing to provide further details if the group is willing to go in this direction. | See 11-17-YYYYrY |

**OBSS\_PD SR Behavior CIDs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **12304** | Laurent Cariou | 27.9.2 | 290.25 | OBSS\_PD based spatial reuse operation is defining specific rules and equations when applied to an SRG (SR group). In some managed environments, the definition and settlement of SRG can be done in a proprietary way within an ESS. In less managed environments, such SRG formation would require a specific protocol and specific frame exchanges. The spec should define such protocol to extend the usability of the SRG OBSS\_PD SR mode | Define the protocol and frame exchanges needed to establish an SRG among neighboring APs. | See 11-17-TTTTrY |
| **14091** | Yuchen Guo | 27.9.2.1 | 290.31 | There is no "RXSTART.indication" defined in the SPEC | change "RXSTART.indication" to "PHY-RXSTART.indication" | See 11-17-LLLLrY |
| **13062** | Osama Aboulmagd | 27.9.2.1 | 290.32 | The two actions on page 290, it is not clear if it is (a) and (b) as in line 32 or (a) or (b) as in line 60. Need to make it clear. | as in comment | See 11-17-LLLLrY |
| **11742** | GEORGE CHERIAN | 27.9.2.1 | 290.38 | When an AP hosts multiple BSSs, but does not support Multi-BSSID feature (for various reasons), the STAs that are associated to one of the BSS of the AP would not know what other BSSs are that are hosted by the same AP. Hence the STA may perform SR over those packets for other BSSs hosted by the same AP. Fix it. | As in the comment. May need some indication from the AP. |  |
| **12018** | James Yee | 27.9.2.l | 290.38 | In the bullet "The received PPDU is an inter-BSS PPDU (see 27.2.2 (Intra-BSS and inter-BSS frame determination))and the received PPDU is not a non-HT PPDU carrying a response frame (Ack, BlockAck orCTS frame), or the received PPDU contains a CTS and a PHY-CCA.indication transition fromBUSY to IDLE occurred within the PIFS time immediately preceding the received CTS and thattransition corresponded to the end of an inter-BSS PPDU that contained an RTS that was ignoredfollowing this procedure", it is not clear why the prior RTS can affect the STA's decision on later the received CTS and what if the this prior RTS is never received by the STA. | Please clarify. | See 11-17-LLLLrY |
| **13929** | Yongho Seok | 27.9.2.1 | 290.39 | "The received PPDU is an inter-BSS PPDU (see 27.2.2 (Intra-BSS and inter-BSS frame determination)) and the received PPDU is not a non-HT PPDU carrying a response frame (Ack, BlockAck or CTS frame),..."The prerequisite of the second condition is that the received PPDU is an inter-BSS PPDU.Because the Ack and CTS frame can't be classifed as an inter-BSS PPDU, the prerequisite of the second condition never be met. Please remove the unnecessay example. | Change as the following:"The received PPDU is an inter-BSS PPDU (see 27.2.2 (Intra-BSS and inter-BSS frame determination)) and the received PPDU is not a non-HT PPDU carrying a response frame (BlockAck),..." | See 11-17-LLLLrY |
| **11556** | Dorothy Stanley | 27.9.2.1 | 290.40 | regarding "or the received PPDU contains a CTS and a PHY-CCA.indication transition from BUSY to IDLE occurred within the PIFS time immediately preceding the received CTS and that transition corresponded to the end of an inter-BSS PPDU that contained an RTS that was ignored following this procedure.", this was predicated on PHY of STA issues PHY-CCA.indication with a value equal to BUSY. Is this trying to say that you can't ignore an RTS/CTS? | as in comment | See 11-17-LLLLrY |
| **14114** | Yuichi Morioka | 27.9.2.1 | 290.40 | "the received PPDU is not a non HT PPDU carrying a response frame...". The recipient only knows the content of the PPDU at the end of the PPDU, which contradicts with line 32 "a) issue a PHY-CCA-RESET.request primitive before the end of the PPDU" | Remove part that reads "carrying a response frame" | See 11-17-LLLLrY |
| **12188** | kaiying Lv | 27.9.2.1 | 290.51 | An HE STA with dot11HESRPOptionImplemented should follow the OBSS\_PD level based on 27.9.4 | Change the following condition to "(defined in 27.9.2.2 (Adjustment of OBSS\_PD and transmit power) or 27.9.4 (Interaction of OBSS\_PD and SRP-based spatial reuse)). | See 11-17-LLLLrY |
| **14213** | Yunbo Li | 27.9.2.1 | 290.53 | HE PPDU should not be excluded in the first three sub bullets. | delete "non-HE" in all the sub bullets. | See 11-17-LLLLrY |
| **13152** | Qi Xue | 27.9.2.1 | 290.58 | Change to "An NDP frame" | As in the comment | See 11-17-LLLLrY |
| **11257** | Albert Petrick | 27.9.2.1 | 290.60 | Text states "A STA that takes actions (a) or (b) under the conditions ...." Actions (a) or (b) not defined, need more clarity. | Sentence needs to be rewritten. What are actions (a) or (b) | See 11-17-LLLLrY |
| **11773** | Graham Smith | 27.9.2.1 | 290.60 | "PHY-CCARE-SET.request" should be "PHY-CCARESET.request"A STA that takes actions (a) or (b) under the conditions of the previous paragraph is deemed to perform NON\_SRG-OBSS\_PD-based spatial reuse (see 27.11.6 (SPATIAL\_REUSE))."PHY-CCARE-SET.request" should be "PHY-CCARESET.request" OK, but what about the next set of criteria which follows a PHY-RXSTART, what is that deemed to be? Is this SRG-OBSS\_PD-based? If not why the distinction? | Please clarify | See 11-17-LLLLrY |
| **11811** | Guoqing Li | 27.9.2.1 | 290.60 | There is listed action (a) or (b). | Clarify | See 11-17-LLLLrY |
| **13153** | Qi Xue | 27.9.2.1 | 290.60 | Conditions (a) & (b) are not defined in the previous paragraph. Suggest rewording."A STA that takes actions (a) or (b) under the conditions of the previous paragraph..." | As in the comment | See 11-17-LLLLrY |
| **13931** | Yongho Seok | 27.9.2.1 | 291.03 | "The received PPDU is an Inter-BSS PPDU (see 27.2.2 (Intra-BSS and inter-BSS frame determination))"Because the prerequisite of an SRG PPDU is an Inter-BSS PPDU, the above sentence is not needed. | Remove the cited sentence. | See 11-17-LLLLrY |
| **13930** | Yongho Seok | 27.9.2.1 | 291.07 | Similar to the NON\_SRG-OBSS\_PD-based spatial reuse,If an HE STA receives a CTS frame immediately after an RTS (e.g., MU-RTS frame) that is a SRG frame, the SRG-OBSS\_PD-based spatial reuse can be applied to the CTS frame. | Insert the following sentence:"The received PPDU contains a CTS and a PHY-CCA.indication transition from BUSY to IDLE occurred within the PIFS time immediately preceding the received CTS and that transition corresponded to the end of an SRG PPDU that contained an RTS (including a MU-RTS) that was ignored following this procedure." | See 11-17-LLLLrY |
| **12541** | Liwen Chu | 27.9.2.1 | 291.08 | I assume that AP also follows trhe same rules. | Fix the issue mentioned in comment. | See 11-17-LLLLrY |
| **12189** | kaiying Lv | 27.9.2.1 | 291.15 | An HE STA with dot11HESRPOptionImplemented should follow the OBSS\_PD level based on 27.9.4 | Change the following condition to "(defined in 27.9.2.2 (Adjustment of OBSS\_PD and transmit power) or 27.9.4 (Interaction of OBSS\_PD and SRP-based spatial reuse)). | See 11-17-LLLLrY |
| **14115** | Yuichi Morioka | 27.9.2.1 | 291.17 | There is no way for HE STA to know that the non-HT PPDU does not carry a certain frame before the end of the PPDU. | Remove conditions that will not be known to the receiving STA until the end of the PPDU. | See 11-17-LLLLrY |
| **14214** | Yunbo Li | 27.9.2.1 | 291.18 | HE PPDU should not be excluded in the first three sub bullets. | delete "non-HE" in all the sub bullets. | See 11-17-LLLLrY |
| **12080** | Jinjing Jiang | 27.9.2.1 | 291.20 | Public Action frame includes the FTM frame, duplicate items in the bullets? | Remove "or an FTM frame" | See 11-17-LLLLrY |
| **11741** | GEORGE CHERIAN | 27.9.2 | 291.30 | Currently, SR\_DELAY and SR\_RESTRICTED is applicable for both SRP & OBSS-PD. Remove the applicability of SR\_DELAY and SR\_RESTRICTED for OBSS-PD | As in the comment | See 11-17-LLLLrY |
| **12019** | James Yee | 27.9.2.l | 291.30 | P. 290 line 30-61 are defining NON\_SRG\_OBSS\_PD-based spatial reuses, here the spec should also require the PPDU received is not from a SRG STA. | As provided in comment. | See 11-17-LLLLrY |
| **14116** | Yuichi Morioka | 27.9.2.1 | 291.33 | In order to allow efficient use of SR resource, STA should be allowed to subtract the time it took to determine that the received PPDU is an inter-BSS PPDU from its BO timer.This is especially important to effectively utilize the SR resource, because by the time the BO expires in many cases the OBSS PPDU would be already be finished. | Add "If the PHYCCARESET.request primitive is issued before the end of the PPDU, the Backoff counter of the STA may be decremented by the time it took from the beginning of the PPDU until the PHYCCARESET.request primitive was issued" | See 11-17-LLLLrY |
| **14117** | Yuichi Morioka | 27.9.2.1 | 291.34 | Even if the TXOP is limited to the duration of the PPDU, the STA is allowed to send an SR PPDU that extends beyond the end of the TXOP. This SR PPDU will collide with the response frame of the MU transmission. | Add description as to how the SR PPDU will not collide with response to MU transmission. | See 11-17-LLLLrY |
| **14278** | Yusuke Tanaka | 27.9.2.1 | 291.34 | This rule limits the TXOP obtained by the OBSS\_PD mechanism to the duration of the HE MU PPDU to prevent interfering. According to IEEE802.11 2016, start of PPDU shall be within TXOP but end of PPDU could exceed the end of TXOP so limitation of TXOP is not enough and the duration of PPDU must be limited as well. | Add "and the duration of transmitting PPDU shall not exceed the end of the PPDU" after "the TXOP shall be limited to the duration of the PPDU" | See 11-17-LLLLrY |
| **11736** | Geonjung Ko | 27.9.2.1 | 291.37 | According to the subclass 27.11.6 (SPATIAL\_REUSE), when a STA transmits a Trigger frame, it is recommended to set the TXVECTOR parameter SPATIAL\_REUSE to SR\_DELAY or SR\_RESTRICTED. Since a Trigger frame is allowed to be sent in a HT or VHT PPDU, there may be other frames aggregated to the Trigger frame in the same PPDU. If an inter-BSS STA transmits a frame based on the OBSS\_PD-based SR on the PPDU, STAs solicited by the Trigger frame may not be able to respond to the Trigger frame after the CCA. Therefore, we can define the operation for a STA which received a Trigger frame, for example, the similar operation when the Spatial Reuse field is set to SR\_DELAY or SR\_RESTRICTED. | Add"If the PHY-CCARESET.request primitive is issued before the end of the PPDU, and a TXOP is initiated within the duration of the PPDU, then the TXOP should be limited to the duration of the PPDU if a Trigger frame is in the PPDU." | See 11-17-LLLLrY |
| **11775** | Graham Smith | 27.9.2.2 | 291.39 | 27.9.2.2. Adjustment of OBSS\_PD and transmit power. 17/0582 clearly shows problems withj this method and in reality no-one would or should implement it. If they did they would soon switch it off. It sounds good that reducing the poower makes you less of an interefer, but if you reduce the power, you reduce the SNIR of the wanted transmission, hence you decrease the MCS , you still have a good possibility of not being successful. Hence you slow down the network. How this is supposed to be an improvement for HE defeats me. In addition there are no rules for transmission other than reducing the power. 17/582 clearly shows that it can only work if a dynamic CCA threshold (DSC) is used but the lobby has refused to allow that. This is a bad feature as it stands and either should be deleted or the text in 17/1003 should be adopted which at least makes it work over a greater set of conditions. | Adopt text in 17/1003 | See 11-17-LLLLrY |
| **14279** | Yusuke Tanaka | 27.9.2.2 | 291.39 | When a HE STA lowers the transmission power based on OBSS-PD, the transmission may not be heard by another STA in the BSS and it could cause inter-BSS collision more than regular transmission. | Define a mechanism to adjust RTS threshold based on modified transmission power or OBSS-PD levels. | See 11-17-LLLLrY |
| **11774** | Graham Smith | 27.9.2.2 | 291.41 | "Adjusting the OBSS\_PD level and transmit power can improve the system level performance and the utilization of the spectrum." It has been shown that this is not true, 17/0582 shows pretty clearly that this does not work. If the lobby insists on retaining this feature, then at least avoid alternative truths. Delete | Delete "Adjusting the OBSS\_PD level and transmit power can improve the system level performance and the utilization of the spectrum." | See 11-17-LLLLrY |
| **14280** | Yusuke Tanaka | 41 | 291.41 | First sentence describes advantages of adjusting the OBSS\_PD level and transmit power from the view of system level. However a STA itself can't be aware of system level improvement but can be aware of only the STA's performance by itself. Advantages from the view of the STA should be added, otherwise there is no incentive or motivation for the STA to take adjusting the OBSS\_PD level and transmit power. | Add description about advantage form the view of the STA like follows;The STA which adjusts the OBSS\_PD level and transmit power can ignore transmitted signals received from outside the range which it intends to execute communication and gain opportunity to comunicate with intended partner. | See 11-17-LLLLrY |
| **13063** | Osama Aboulmagd | 27.9.2.2 | 291.46 | This clause provides the rules for adjusting OBSS\_PD value. However it doesn't state when this change is requested, i.e. what event does trigger this adjustment? | as in comment | See 11-17-LLLLrY |
| **11777** | Graham Smith | 27.9.2.2 | 291.47 | Equation 27-3 indicates that the TX power may be less than the simple rule and could, in fact, be set to zero. Seems pretty dumb to me to have the < sign there as it is bad enough already and can one really see devices using less than the permitted power if they were dumb enough to do this anyway? | Replace ╘δ± with = | See 11-17-LLLLrY |
| **11778** | Graham Smith | 27.9.2.2 | 292.06 | Figure 27-9 indicates that the TX power may be less than the simple rule and could, in fact, be set to zero. Seems pretty dumb to me t as it is bad enough already and can one really see devices using less than the permitted power if they were dumb enough to do this anyway? | Delete the shading and change the arrow on "Allowable OBSS\_Pdlevel" to point at the edge. | See 11-17-LLLLrY |
| **11939** | James June Wang | 27.9.2.2 | 292.31 | RSSI\_LEGACY is a relative value with value 0 to 277. It is not clear that it can be used to compare with OBSS\_PD. | Please clarify it. | See 11-17-LLLLrY |
| **13932** | Yongho Seok | 27.9.2.2 | 292.32 | "If the bandwidth of the received PPDU differs from 20 MHz, then the value of the OBSS\_PDlevel is increased by 10 log (bandwidth/20 MHz)."More exactly, apply a floor to a log. | As in comment. | See 11-17-LLLLrY |
| **11779** | Graham Smith | 27.9.2.2 | 292.45 | "output of the antenna connector" What about printed antennas? | Replace cited text with "at the input to the antenna" or better still check with 11md where this has come up. | See 11-17-LLLLrY |
| **13064** | Osama Aboulmagd | 27.9.2.2 | 292.46 | The two terms SRG OBSS\_PD and Non-SRG OBSS\_PD appear suddenly in the middle of page 292. Need to at least introduce the terms and why two of them are needed. | as in comment | See 11-17-LLLLrY |
| **13933** | Yongho Seok | 27.9.2.2 | 292.47 | "An AP may define SRG OBSS PD Min Offset and SRG OBSS PD Max Offset values that are used by its associated STAs and by the AP to derive an SRG OBSS\_PD level for determining reception behavior for inter-BSS PPDUs that are determined to be SRG PPDUs."An AP can makes different SRG OBSS PD Min Offset and SRG OBSS PD Max Offset values for different SRG BSSs. For supporting this, an AP may include one or more Spatial Reuse Parameter Set element. | Sepcify that an AP can include one or more Spatial Reuse Parameter Set element. | See 11-17-LLLLrY |
| **12022** | James Yee | 27.9.2.2 | 292.57 | Throughout the spec, it is never explained how the SRG indicated by a Spatial Reuse Parameter Set elementan is formed by an HE AP STA. The spec should either provide some information or say this is not within the scope of this spec. | Please clarify. | See 11-17-LLLLrY |
| **11938** | James June Wang | 27.9.2.2 | 292.63 | Why do we have this condition "Non-SRG OBSS PD Max Offset ╘δ± SRG OBSS PD Max Offset" ? It is not clear they are related. | Please clarify or remove | See 11-17-LLLLrY |
| **11557** | Dorothy Stanley | 27.9.2.2 | 293.12 | Table 27-6, what is "OBSS\_PD SR Disallowed"? | as in comment | See 11-17-LLLLrY |
| **11828** | Guoqing Li | 27.9.2.2 | 293.15 | InTable 27-6, the use of "Spatial Reuse Paraeter Set element not received" set to 0 is not a natural way to say this paramemeter set is receive. Change the wording to "Spatial Reuse parameter set element received" and change the "0" and "1" in this table accordingly. | Change the wording to "Spatial Reuse parameter set element received" and change the "0" and "1" in this table accordingly. | See 11-17-LLLLrY |
| **11831** | Guoqing Li | 27.9.2.2 | 293.15 | In Table 27-6, the use of 0 and 1 is understood, but this is not setting a value for a particular field. Change 0 and 1 to "yes" or "no". | Change 0 and 1 to "yes" or "no". | See 11-17-LLLLrY |
| **13855** | Yonggang Fang | 27.9.2.2 | 293.24 | Is the value of Non-SRG OBSS PD Max -82 or -62 for the case of OBSS\_PD\_SR Disallowed = 1? |  | See 11-17-LLLLrY |
| **11829** | Guoqing Li | 27.9.2.2 | 293.41 | In Table 27-7, The use of "Spatial Reuse Paraeter Set element not received" set to 0 is not a natural way to say this paramemeter set is receive. Change the wording to "Spatial Reuse parameter set element received" and change the "0" and "1" in this table accordingly. | Change the wording to "Spatial Reuse parameter set element received" and change the "0" and "1" in this table accordingly. | See 11-17-LLLLrY |
| **11832** | Guoqing Li | 27.9.2.2 | 293.41 | In Table 27-7, the use of 0 and 1 is understood, but this is not setting a value for a particular field. Change 0 and 1 to "yes" or "no". | Change 0 and 1 to "yes" or "no". | See 11-17-LLLLrY |
| **11558** | Dorothy Stanley | 27.9.2.2 | 293.56 | regarding "shall not perform SRP-based SR transmissions", why is this in the OBSS\_PD-based section? | as in comment | See 11-17-LLLLrY |
| **11559** | Dorothy Stanley | 27.9.2.3 | 294.03 | the grammar in the paragraph is undecipherable | as in comment | See 11-17-LLLLrY |
| **14118** | Yuichi Morioka | 27.9.2.3 | 294.03 | What happens to the case where the HE STA ignores an inter-BSS PPDU but does not initiate countdown because it has nothing to send? The power restriction period should not start in this case. | Add description that the power restriction period only starts when the STA starts countdown. | See 11-17-LLLLrY |
| **14285** | Yusuke Tanaka | 27.9.2.3 | 294.04 | We should consider the case a STA whose queue is empty ignored an inter-BSS PPDU for receiving opportunity. The STA does not intend transmission which would cause interference, so the OBSS\_PD SR transmit power restriction period should not be applied to the STA. Otherwise the restriction period for such a STA, e.g. a light traffic device, is going to be unreasonably long. | Two suggestion.1. OBSS\_PD SR transmit power restriction period shall be applied to only a STA which starts countdown of backoff.2. Define upper limit of OBSS\_PD SR transmit power restriction period. | See 11-17-LLLLrY |
| **11942** | James June Wang | 27.9.2.3 | 294.06 | Should have a maximum value (such as maximum allowable TXOP duration) for OBSS\_PD SR transmit power restriction period regardless when STA gains TXOP its backoff reaches zero. Since it might take a long time for backoff to reach zero in some cases. | Recommend to change to --- This OBSS\_PD SR transmit power restriction period shall be terminated at the end of the TXOPthat the STA gains once its backoff reaches zero or TBD duration whichever is sooner". | See 11-17-LLLLrY |
| **11940** | James June Wang | 27.9.2.3 | 294.07 | Note 1 and Note 2 should be nomative text. | Change to nomative text | See 11-17-LLLLrY |
| **11781** | Graham Smith | 27.9.2.3 | 294.11 | "TXP-Wrmax" should not have the "-" | Delete "-" | See 11-17-LLLLrY |
| **13934** | Yongho Seok | 27.9.2.3 | 294.14 | The TXPWR\_max that calculated with the chosen non-SRG SRG OBSS\_PD level have to also limit the maximum transmit power of the UPH calculation, depending on the CS Required subfield. | Insert the following sentence:"If a Trigger frame is received within an ongoing OBSS\_PD SR transmit power restriction period, the maximum UL transmit power of an HE TB PPDU in Equation (27-1) shall be equal or lower than the TXPWRmax, calculated with the chosen non-SRG OBSS\_PD or SRG OBSS\_PD level with Equation (27-4), except when the CS Required subfield of the Common Info field of the Trigger frame is set to 0. In which case, the maximum UL transmit power of an HE TB PPDU is not constrained by TXPWRmax of the OBSS\_PD SR transmit power restriction. | See 11-17-LLLLrY |
| **13935** | Yongho Seok | 27.9.2.3 | 294.22 | "...for the transmissions of any PPDU (including HE Trigger-Based PPDU) until the end of the OBSS\_PD SR transmit power restriction period."As same with non-SRG OBSS\_PD, please include the following exception case."including HE Trigger-Based PPDU, except when the HE TB PPDU is triggered by a Trigger frame having the CS Required subfield set to 0" | Change as the following:"...for the transmissions of any PPDU (including HE Trigger-Based PPDU, except when the HE TB PPDU is triggered by a Trigger frame having the CS Required subfield set to 0) until the end of the OBSS\_PD SR transmit power restriction period." | See 11-17-LLLLrY |
| **14287** | Yusuke Tanaka | 27.9.2.3 | 294.22 | "(including HE Trigger-Based PPDU)" should be "(including an HE TB PPDU, expect when the HE TB PPDU is triggered by a Trigger frame having the CS Required subfield set to 0)" | As commented. | See 11-17-LLLLrY |
| **12540** | Liwen Chu | 27.9.2.3 | 294.27 | the notes are too weak. Transferring them to normative requirement. | Fix the issue mentioned in comment. | See 11-17-LLLLrY |
| **13155** | Qi Xue | 27.9.2.3 | 294.27 | Add a normative text to cover the following two notes:NOTE 1--The STA can increase but not decrease the chosen SRG OBSS\_PD level or non-SRG OBSS\_PD level during an OBSS\_PD SR transmit power restriction period.NOTE 2--The STA's power is always equal or lower than the minimum TXPWRmax among all TXPWRmax from ongoing OBSS\_PD SR transmit power restriction periods. | As in the comment | See 11-17-LLLLrY |
| **11812** | Guoqing Li | 27.9.2.3 | 294.29 | Note 1 is unnecessary. STA should be allowed to decrease its OBSS\_PD level to be more conservative. This restriction does not not seem necessary. | Remove NOTE 1. | See 11-17-LLLLrY |
| **13065** | Osama Aboulmagd | 27.9.2.3 | 295.01 | Figure 27-10 is an enigma to me. It needs some explanation and those S1 and D1. | as in comment | See 11-17-LLLLrY |
| **14216** | Yunbo Li | 27.9.2.3 | 295.01 | Since restriction period 1, 2 and 3 terminated at the same time, why do we need to introduce multiple restriction periods in the mechanism? | Can we keep only single restriction period during the OBSS\_PD\_SR? | See 11-17-LLLLrY |
| **11941** | James June Wang | 27.9.2.3 | 295.10 | In Figure 27-10 "S2 max TXPWR is equal to max (..." should be change to "min (... " | as indicated | See 11-17-LLLLrY |
| **13420** | Sigurd Schelstraete | 27.9.2.3 | 295.20 | In Figure 27-10, SR S2 detects all inter-BSS packets and resumes its AIFS/BO processing once it has established that SR can be applied. However, in the figure inter-BSS transmission OBSS PPDU D1'-S1' is ignored by SR S2, even though the AIFS/BO counter has not yet reached zero. Why is this? | Clarify | See 11-17-LLLLrY |
| **11813** | Guoqing Li | 27.9.2.4 | 295.40 | In this figure It is more reasonable that the S2 max TXPWR is equal to min (...), not max (...). The STA should honor the power contraint calculated over all the previous ignored OBSS PPDU. | change max (...) to min (...) | See 11-17-LLLLrY |
| **12250** | kaiying Lv | 27.9.2.3 | 295.46 | Change the " max (NON SRGTXPWRmax1, NON SRG TXPWRmax 2, SRGTXPWRmax 3)" in the figure to "min (NON SRGTXPWRmax1, NON SRG TXPWRmax 2, SRGTXPWRmax 3)" | as comment | See 11-17-LLLLrY |
| **14288** | Yusuke Tanaka | 27.9.2.3 | 295.46 | In Figure 27-10, S2 max TXPWR should be equal or lower than the minimum TXPWERmax among all TXPWRmax from ongoing OBSS\_PD SR transmit power restriction periods. | Change "S2 max TXPWR is equal to max" to "S2 max TXPWR is equal to min" in Figure 27-10 | See 11-17-LLLLrY |
| **14289** | Yusuke Tanaka | 27.9.2.4 | 295.55 | The specification needs to define a way for a STA to detect other PPDUs under receiving ongoing PPDU after PHYCCARESET.request is issued before the end of the inter-BSS PPDU | Define a threshold at which a STA's PHY will issue PHY-CCA.indication with a value equal to BUSY upon detection of energy above the threshold during the inter-BSS PPDU. The threshold shall be relative to the reception power of the inter-BSS PPDU. If the threshold is same as OBSS\_PD, SINR could be low not to detect a preamble. | See 11-17-LLLLrY |
| **12069** | Jing Ma | 27.9.2.4 | 295.57 | The MAC may not be able to determine whether continue backoff countdown because the MAC may not get the clear BUSY/IDLE indication about the medium from the PHY regarding procedure described in 27.9.2 and 28.3.21 HE receive procedure. Further details about the interaction between the MAC and PHY should be added.According to the precedure in 27.9.2.1(General), the MAC issues and sends PHY-CCARESET.request primitive to the PHY.Then no further description about how the PHY reacts and indicates MAC the medium "BUSY" or "IDLE" in current ax draft.If follow the specification of PHY-CCARESET.request(IPI-STATE) primitive in baseline (see 8.3.5.10 in 802.11-2016), the PHY reset the CCA state machine and send a PHY-CCARESET.confirm to the MAC with observed IPI values which are the values not a BUSY/IDLE indication.As a result, the MAC may not be able to determine whether continue backoff countdown because there seems no clear indication from the PHY saying the medium is BUSY/IDLE | Please add specification about how the MAC determines whether continue backoff countdown based on the IPI values provided by the PHY after issue PHY-CCARESET.request.Or add a STATE parameter indicating the medium "BUSY/IDLE" to PHY-CCARESET.confirm primitive which is similar with PHY.CCA.indication primitive | See 11-17-LLLLrY |
| **14119** | Yuichi Morioka | 27.9.2.4 | 295.58 | There is no requirement on when the STA that issued the CCARESET.request primitive during the inter-BSS PPDU re-issues the BUSY indication. If there is no such requirement, multiple SR transmissions will just collide with one another. | Define requirement on how the HE STA issues the BUSY indication when a) the inter-BSS is still being sent and b)another HE STA starts an SR PPDU transmission. | See 11-17-LLLLrY |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **12542** | Liwen Chu | 27.9.2.4 | 303.01 | Add the rule that the AIFS rule still needs to be respected. | As in comment | See 11-17-LLLLrY |

**SRP Behavior CIDs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **12190** | kaiying Lv | 27.9.3 | 295.60 | Make it consistent by changing "SRP\_PPDU-based spatial reuse" to "DSRP\_PPDU-based spatial reuse " or vice versa. | As comment | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12190 |
| **12194** | kaiying Lv | 27.9.3 | 295.60 | Multiple SR PPDUs from different STAs may interfere the reception of SRP PPDU. Mechanism to reduce the interference needs to be considered. | Please clarify it | See 11-17-KKKKrY |
| **11782** | Graham Smith | 27.9.3 | 295.62 | "When the conditions specified in 27.9.3 (SRP-based spatial reuse operation) are met that allow the transmission of an SR PPDU, an HE STA may transmit an SR PPDU to a STA that has indicated support for the role of SR responder." Seeing that this is the opening sentence to 27.9.3 it does not really tell me much except that "this clause will tell me what this clause says" . Delete | Delete cited text | Accept – commenter to note that the same requirement is formally stated in 27.9.3.4 |
| **13157** | Qi Xue | 27.9.3 | 295.63 | Add the exact HE capability below to remove ambiguity of the following sentence:"When the conditions specified in 27.9.3 (SRP-based spatial reuse operation) are met that allow the transmission of an SR PPDU, an HE STA may transmit an SR PPDU to a STA that has indicated support for the role of SR Responder" | As in the comment | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13157, commenter to note that the text is deleted because the same requirement, with an explicit reference to the subfields in 27.9.3.4 |
| **13557** | SUNGEUN LEE | 27.9.3 | 295.64 | By definition in Clause 3, SR\_PPDU with underscore (not SR PPDU) is the correct description | Change SR PPDU to SR\_PPDU, i.e., change to 'transmission of an SR\_PPDU' and 'transmit and SR\_PPDU' (two places) | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13557, which instruct the editor to search for and replace all occurrences of “SR PPDU” with “SR\_PPDU” |
| **13936** | Yongho Seok | 27.9.3 | 295.65 | "When the conditions specified in 27.9.3 (SRP-based spatial reuse operation) are met that allow the transmission of an SR PPDU, an HE STA may transmit an SR PPDU to a STA that has indicated support for the role of SR Responder."The SR Responder is too general. It seems that it covers all SR responders (including OBSS PD SR). More exactly, the SR Responder means the SRP Response. | Replace "SR Responder" with "SRP Responder" throughout D2.0. | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13936, which instruct the editor to search for and replace all occurrences of “SR Responder” with “SRP Responder” |
| **12071** | Jing Ma | 27.9.3.1 | 296.00 | What does "RPL" represent? Please clarify it somewhere in the draft | as in comment | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12071, commenter to note that RPL was defined in 2.0, but the definition is made more visible with the proposed changes |
| **11783** | Graham Smith | 27.9.3 | 296.03 | "using an adjusted transmit power level for the duration of an ongoing PPDU" What adjusted powe levels? Any level or tied to the OBSS\_PD formula? Make clear | As per comment | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11783, which adds a reference to the tx power adjustment subclause |
| **13558** | SUNGEUN LEE | 27.9.3 | 296.10 | Table 9-262aa is not HE MAC Capabilities, but HE PHY capabilities, so correct Table should be referred. In addition to SR Responder subfield in HE MAC Capabilities, SRP-based SR Support in HE PHY Capabilities should be set to 1 fundermantally to do SRP-based SR. The condition and clarification of HE PHY Capabilities should be described in here | Describe the condition and clarification of SRP-based SR Support subfield in HE PHY Capabilities for SRP-based SR operation, and update the referred Table information accordingly based on the updated text | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13558 |
| **11816** | Guoqing Li | 27.9.3 | 296.18 | According to definition of SRP PPDU, it is the PPDU that contains trigger frame, so it has to be a DL PPDU. However, in this sentence "ensuing uplink SRP\_PPDU", it is referred to as uplink PPDU. This is consistent. I think this "PPDU" is meant to say the trigger-based PPDU. If so, please correct the wording. | change to "trigger-based PPDU" | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11816 |
| **12192** | kaiying Lv | 27.9.3 | 296.18 | Only HE SU or HE EXT SU PPDU can set the SPATIAL\_REUSE field in HE SIGA to SR\_DELAY. Is it necessary to specify that the SR field in the Common Info field of the trigger frame shall not be set to SR\_DELAY? If so, what about SR\_RESTRICTED? | Remove the sentence "An AP sending a trigger frame shall not set the SR field in the Common Info field of the trigger frame to SR\_DELAY." | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12192 |
| **13560** | SUNGEUN LEE | 27.9.3 | 296.18 | No clear description and/or defination is provided what SRP\_PPDU is. | Please provide the description and definition of SRP\_PPDU | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13560 |
| **13937** | Yongho Seok | 27.9.3 | 296.18 | "...from performing SRP-based SR transmission during the ensuing uplink SRP\_PPDU duration."Definition of the SRP\_PPDU is missed. | Include the definition of the SRP\_PPDU in clause 3.2. | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13937 |
| **14291** | Yusuke Tanaka | 27.9.3.0 | 296.24 | If the STA received a Trigger frame carried in HE MU PPDU with SR\_RESTRICTED indication, DSRP\_PPDU-based spatial reuse can not initiate? | Clarify. If so add a exception rule into the conditions below. | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 14291 |
| **11817** | Guoqing Li | 27.9.3.1 | 296.28 | "SR-PPDU is queue" sounds like there is a special type of PHY PPDU format called SR-PPDU. However, I think this is only meant the PPDU to be transmitted in the SRP opportunity. If so, please remove the word "SR\_PPDU". Or, if there is really some special condition that quality a PPDU type to be called SR\_PPDU, please clarify. | change "SR\_PPDU" to "PPDU" or clarify what is qualified as "SR\_PPDU". | Reject – a definition of SR\_PPDU already exists |
| **12253** | kaiying Lv | 27.9.3.1 | 296.28 | change the "SR\_PPDU " to " SR PPDU" | as comment | Reject – SR\_PPDU is a defined term from 3.2 and includes the underscore |
| **13832** | Yasuhiko Inoue | 27.9.3.1 | 296.30 | RPL should be listed in 3.4. | As in the comment. | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13832 |
| **13561** | SUNGEUN LEE | 27.9.3.1 | 296.31 | The values currently defined in Table 28-21 is all values for behavior indication, not for SRP power adjuement (values 1-12 are reserved), so the SRP description in here is not correct | Either define the values in Table 28-21 or change the description | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13832 |
| **11820** | Guoqing Li | 27.9.3.1 | 296.32 | This paragraph is confusing. First, it refers to use the SRP value in Table 28-21 which is the SRP value in HE SU/ER SU/MU PPDU. And then it says this value is based on the SR info in trigger frame. So which SRP value is to be used in figuring out SRP opporunity and power level? | Clarify | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11820, which corrects the table reference to HE TB PPDUSee also CID 11978 which fixes the table reference for the common info spatial reuse field, which should have directly referenced table 28-20 which is the HE TB PPDU SIG-A table and which contains a reference to table 28-22, which is the SRP encoding for HE TB PPDU. |
| **12254** | kaiying Lv | 27.9.3.1 | 296.32 | Change "Table 28-21 (Spatial Reuse subfield encoding for an HE SU PPDU,HE ER SU PPDU, and HE MU PPDU) " to "Table 28-22 (Spatial Reuse subfield encoding for an HE TB PPDU)" | as comment | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12254 |
| **13562** | SUNGEUN LEE | 27.9.3.1 | 296.33 | RPL definition would be part of bullet 2) not in the subbullet of a) or b) | Add the RPL definition before subbullet a) and b) and delete the description in the subbullets | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13562, which does something very similar to what the commenter suggests, noting that SRP is mentioned before RPL, so the natural order should be to describe SRP before RPL. |
| **13833** | Yasuhiko Inoue | 27.9.3.1 | 296.38 | "The value of the Spatial Reuse information of the SIGA SRP field of the HE TB PPDU that ..."This text is ambiguous and should be improved. | Following text will be better."The value of the Spatial Reuse field in HE-SIG-A of the HE TB PPDU that ..." | Reject – the value to be used is not actually the value of the field, but a value that is based on the field value after performing a lookup into a table. |
| **11560** | Dorothy Stanley | 27.9.3.1 | 296.50 | what is difference between RXVECTOR BSS\_COLOR and BSS color of the DSRP\_PPDU? They seem like they would be derived from the same PPDU | as in comment | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11560 |
| **11819** | Guoqing Li | 27.9.3.1 | 296.50 | Shouldn't it be "does not match the BSS color |  | Reject – the HE TB PPDU color has to match the trigger color, otherwise, the SRP information obtained from the trigger common info field is not applicable to the HE TB PPDU. Similarly, if the SRP information read from the HE TB PPDU does not match the color of the trigger frame, then the interference calculation that was performed on the trigger frame is not valid. |
| **13563** | SUNGEUN LEE | 27.9.3.1 | 297.01 | By definition in Clause 3, SR\_PPDU with underscore (not SR PPDU) is the correct description | Change SR PPDU to SR\_PPDU | Accept |
| **12075** | Jing Ma | 27.9.3.2 | 297.21 | Even an HE STA identifies an SRP opportunity, SRP\_PPDU-based SR transmission may not work because of the specification of the interaction between the MAC and PHY is not clear enough. Here, the HE STA may not be able to continue the backoff countdown within the HE TB PPDU duration because the medium condition may indicated as BUSY until the end of the ongoing HE TB PPDU.Based on the PHY receive procedure (see 28.3.21 HE receive procedure), when signals come, the PHY measures signal power and issues PHY-CCA.indication(BUSY, channellist) to the MAC.After successfully receiving the HE-SIG-A, the PHY issues PHY-RXSTART.indication then set PHY\_RXEND.indication(Filtered) due to No Matched BSS color in case of SRP\_PPDU-based spatial reuse here.Then the PHY may maintain PHY-CCA.indication(busy, channellist) until the end of the current PPDU duration unless PHY-CCARESET.request received.However, the MAC only ignores PHY-RXSTART.indication(see 27.9.3.1 DSRP\_PPDU ) which means that the PHY-CCA.indication(busy, channellist) may be maintained until the end of the current HE TB PPDU. As a result, the SRP-based SR transmission may never happen. | Add the specification that the MAC issues PHY-CCARESET.request to make the PHY recheck the status of the medium which is similar with OBSS-based SR operation(see 27.9.2.1 General) | Reject – once the PPDU is discarded at the end of the PHY SIG field, the PHY reverts to a search mode with sensitivity at -82 dBm, but meanwhile, the energy of the discarded PPDU continues to arrive – this energy will not cause a new detection event at -82 dBm because the preamble has passed. The discarded PPDU can only trigger BUSY medium now based on ED, which is -62 dBm, and above that, no SR can take place. So the interaction between MAC and PHY is completely specified in such a manner that the SR mechanism will operate correctly, provided that the PPDU being discarded is not at a level > -62 dBm. |
| **11825** | Guoqing Li | 27.9.3.2 | 297.22 | "another SRP\_PPDU" seem to indicate that there is some tag on the particular PPDU that qualifies it as "SRP\_PPDU". However, I think what this sentence really means is a PPDU that can be a potential SRP\_PPDU that the STA can do SRP-based spatial reuse based on it. Suggest to chagne the wording to "another PPDU" | Change to "another PPDU". | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11825 |
| **12261** | kaiying Lv | 27.9.3.2 | 297.32 | If the HE-STA is already executing its backoff procedure employing OBSS\_PDlevel as a threshold for determinationof an IDLE medium condition prior to the reception of an SRP\_PPDU, the intended transmit power of the next SR\_PPDU in the transmission queue as measured at the output of the antenna connector shall be equal to or lower than Min of ( the TXPWRmax calculated with this specific OBSS\_PDlevel using Equation (25-1), transmit power restrictions identified in 27.9.3 (SRP-based spatial reuse operation). The OBSS\_PD SR transmit power restriction period is terminated at the SRP Opportunity Endpoint. | please clarify it | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12261 |
| **12258** | kaiying Lv | 27.9.3.2 | 297.33 | There are "SRP\_PPDU" and "SRP PPDU" in the draft. Please choose one to use | as comment | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12258 |
| **12259** | kaiying Lv | 27.9.3.2 | 297.33 | The SRP PPDU is a PPDU that is a DSRP\_PPDU. | Replace "SRP PPDU" by "DSRP\_PPDU" | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12259 |
| **11826** | Guoqing Li | 27.9.3.2 | 297.36 | The restriction of TXPWRmax here should be effective only before the transmission power restriction period. | Add the wording to say that the power restriction is effect before the transmission power restrcition period. | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11826.Commenter to note that the text actually does refer to the power restriction period of OBSS\_PD operation, and that period is in force at the start of the new PPDU reception and will remain in force, per the rules of OBSS\_PD SR until a transmission occurs. The change is to add a reference to the OBSS\_PD subclause. |
| **11561** | Dorothy Stanley | 27.9.3.2 | 297.37 | what is the correct Eq number? | as in comment | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11561 |
| **13564** | SUNGEUN LEE | 27.9.3.2 | 297.37 | Refered equation for OBSS\_PD is wrong | Change (25-1) to (27-3) in P802.11ax D2.0 | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13564 |
| **13158** | Qi Xue | 27.9.3.2 | 297.42 | Circular reference. Please fix:"After a STA has identified the start of an SRP Opportunity, and until the SRP Opportunity Endpoint is reached, the transmission of any PPDU by the STA shall be limited by the transmit power restrictions identified in 27.9.3 (SRP-based spatial reuse operation)." | As in the comment | Reject – it is not circular, but self-referential, and there is no problem with that. |
| **11827** | Guoqing Li | 27.9.3.2 | 297.51 | This paragraph specifies the value for the trigger frame SR field which is used in TB PPDU. Therefore, the values for this field should be Table 28-22 (SR setting for TB PPDU), not Table 28-21. | Change "Table 28-21" to "Table 28-22" | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11827 |
| **12193** | kaiying Lv | 27.9.3.3 | 298.07 | Suggest to say "the max SNR margin" | Please clarify it | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12193 |
| **14120** | Yuichi Morioka | 27.9.3.4 | 298.26 | Any reason why this is "PPDU" instead of "MPDU" as in line 30? | change PPDU to MPDU | RejectPPDU is what is transmitted on the air and MPDU is what elicits a response, since responses are a MAC level operation. |
| **14300** | Yusuke Tanaka | 27.9.3.5 | 298.33 | SR\_PPDU reception and response transmission requirements are sufficient. If the responder holds no SR\_PPDU in the queue, the responder will not identifies an SRP opportunity. In that case the responder will response to received SR\_PPDU with no transmission power control which interferes the trigger sender. | Define SR\_PPDU reception and response transmission requirements to prevent the commented issue. | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 14300 |
| **12074** | Jing Ma | 27.9.3.5 | 298.34 | It is not clear about what the SR\_PPDU response transmission requirements exactly are by only saying " if all outstanding SRP and OBSS\_PD transmit power requirements are not met by the response transmission" here.Any reference about "all outstanding SRP and OBSS\_PD transmit power requirements" ?Please clarify it. | as in the comment | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12074 |
| **14121** | Yuichi Morioka | 27.9.3.5 | 298.36 | SRP and OBSS\_PD transmit power requirements only apply if the STA has started countdown during an inter-BSS PPDU, i.e. has some PPDU to transmit in the queue. Not sure how this restriction will be helpful if the restriction only apply to such STA. Rather the spec should define a way for SR TXOP initiator to restrict the tx power of responder | Remove this sentence and add description on how the responder effectively selection transmission power. | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 14121 |

**SRP and OBSS\_PD Interaction CIDs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **12195** | kaiying Lv | 27.9.4 | 298.43 | Should be an HE TB PPDU instead of a PPDU? | Please clarify | Reject – correct as worded. At this point, any PPDU can be received, because the condition further includes “failed to identify an SRP opportunity” – since most PPDUs will not contain a trigger, then they will result in a failure to identify an SRP opportunity. I.e. the second condition makes any further qualification to PPDU unnecessary, as that qualification must be met within the description of the SRP opportunity. |
| **11562** | Dorothy Stanley | 27.9.4 | 298.53 | regarding "may use a value of positive infinity", why is the HE STA allowed to use positive infinity for OBSS\_PD\_level? | as in comment | Reject – positive infinity effectively disables OBSS\_PD. Note that SRP SR is a mechanism that uses measured path information to determine interference, and if an SRP opportunity has been identified, then OBSS\_PD level no longer matters – the measured path information and the SRP parameter information together have already indicated that an SR transmission is safe. The generic PD levels no longer matter in this case. |
| **12196** | kaiying Lv | 27.9.4 | 298.53 | The OBSS\_PD level should be set to positive infinity when an SRP opportunity is identified based on the reception of the PPDU. Remove "or lower". | As comment | Reject – a STA may choose to use a lower value if it desires. There is no need to restrict the choices to simply positive infinity and the other values of OBSS\_PD that are determined according to the other rules in 27.9 |
| **12544** | Liwen Chu | 27.9.4 | 298.53 | "positive infinity or lower"change "positive infinity or lower" to "positive or higher"??? This contradict with the further detecting DSRP frame during SRP opportunity. | Fix the issue mentioned in comment. | Reject – the reader has failed to notice the additional qualifier of “as it applies to this PPDU” |
| **12198** | kaiying Lv | 27.9.4 | 298.65 | SR\_DELAY is not a value in the Common Info field SPATIAL\_REUSE of a Trigger frame | Remove "or SR\_DELAY" | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12198 |
| **12200** | kaiying Lv | 27.9.4 | 299.02 | Remove "or lower" | As comment | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12200, which modify the applicability of the OBSS\_PD level in question, but do not acquiesce to the commenter’s request for removal of “lower” |
| **12202** | kaiying Lv | 27.9.4 | 299.03 | Add the following sentence at the end of the paragraph "and may use a value equal to thereceive power of the HE TB PPDU plus 1 dB for the ED level for the duration of this HE TB PPDU" | As comment | Revise – TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12202 |
| **12543** | Liwen Chu | 27.9.4 | 299.08 | a value of negative infinity for the OBSS\_Pdlevel contradicts with | As in comment | Reject – the reader has failed to notice the additional qualifier of “as it applies to this PPDU” |
| **12204** | kaiying Lv | 27.9.4 | 299.09 | Remove "and shall use a valueequal to the receive power of this PPDU minus 1 dB for the ED level for the duration of this PPDU" | As comment | Accept |

**SPATIAL\_REUSE parameter of the TXVECTOR CIDs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **12545** | Liwen Chu | 27.11.6 | 307.36 | why OBSS PD is excluded? | Fix the issue mentioned in comment. | Reject – the condition is HESRP implemented, so this only relates to the SRP case. |
| **12546** | Liwen Chu | 27.11.6 | 307.39 | HE MU, HE SU have no array of four values? | Clarify it | Reject – see the definition of the HE-SIGA for each of the HE PPDU types. |
| **11932** | James June Wang | 27.11.6 | 307.58 | "when permitted by other conditions," is vague | provide references such as "as permitted by other conditions in ... subclauses." | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11932 |
| **12269** | kaiying Lv | 27.11.6 | 307.58 | The HESIGA\_Spatial\_reuse\_value15\_allowed subfield in the SR Control field indicates whether non-AP STAs that are associated with the AP that transmitted this element may set the TXVECTOR parameter SPATIAL\_REUSE to SRP\_AND\_NON-SRG-OBSS-PD\_PROHIBITED SRP-based SR transmissions.So here should be "may" not "shall". | as comment | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12269 |
| **11868** | Guoqing Li | 27.11.6 | 307.59 | There should be a reference section for the "other conditions". | Either add a section number as a reference for the "other conditions", or list the conditions when this field is set to SRP\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED" and when it is se to SRP\_DISALLOWE | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11868 |
| **12271** | kaiying Lv | 27.11.6 | 307.59 | change "when permitted by other conditions" to "when the HESIGA\_Spatial\_reuse\_value15\_allowed sub-field of the SR Control field of the most recently received Spatial Reuse Parameter Set element from its associated AP is equal to 1." | as comment | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12271 |
| **14308** | Yusuke Tanaka | 27.11.6 | 307.60 | Need to clarify "other conditions". | As commented. | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 14308 |
| **12547** | Liwen Chu | 27.11.6 | 308.01 | even if the SRP Disallowed announced by the AP is 0??? | Clarify it | Reject – yes, the AP is free to do what it desires, despite any instructions it might have given to the associated STAs. |
| **13945** | Yongho Seok | 27.11.6 | 308.12 | "An HE STA shall set the TXVECTOR parameter SPATIAL\_REUSE to SRP\_AND\_NON-SRG\_OBSSPD\_PROHIBITED for a PPDU containing an FTM or NDP Announcement frame."In a same logic, an HE STA shall set the TXVECTOR parameter SPATIAL\_REUSE to SRP\_AND\_NON-SRG\_OBSSPD\_PROHIBITED for a PPDU containing the ACK frame of an FTM frame. | As in comment. | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13945 |
| **11933** | James June Wang | 27.11.6 | 308.15 | "An HE STA that transmits an HE SU PPDU or an HE ER SU PPDU that contains a Trigger frame should set the TXVECTOR parameter SPATIAL\_REUSE to SR\_DELAY." It is not clear when to set SR\_DELAY | provide reference such as 27.9.2.1. | Reject – this subclause is the one that sets out the rules and limitations for the value of the SPATIAL\_REUSE parameter within the TXVECTOR. There are no further limitations other than what is described here. If the commenter is uncomfortable with the allowed freedom of choice on the part of the transmitter, he should offer a specific rule that he wishes to include in the draft. |
| **11934** | James June Wang | 27.11.6 | 308.18 | "An HE STA that transmits an HE MU PPDU that contains a Trigger frame should set the TXVECTOR SPATIAL\_REUSE to SR\_RESTRICTED" It is not clear when to set SR\_RESTRICTED | provide reference such as 27.9.2.1. | Reject – this subclause is the one that sets out the rules and limitations for the value of the SPATIAL\_REUSE parameter within the TXVECTOR. There are no further limitations other than what is described here. If the commenter is uncomfortable with the allowed freedom of choice on the part of the transmitter, he should offer a specific rule that he wishes to include in the draft. |
| **13946** | Yongho Seok | 27.11.6 | 308.36 | "...for any PPDU that is not an HE TB PPDU or an NDP PPDU or a PPDU containing an FTM or NDP Announcement frame."The ACK frame of an FTM frame is missed in the exception PPDUs. | As in comment. | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 13946 |
| **12549** | Liwen Chu | 27.11.6 | 308.39 | ontradict with L34.Contradict with FTM, NDP, NDPA setting rules in L7, L11.SR Disallowed is undefined. | Fix the issue mentioned in comment. | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12549 |
| **12290** | Kiseon Ryu | 27.11.6 | 308.44 | If an AP does not include the Spatial Reuse Parameter Set (SRPS) element in a Beacon, Probe Response and Association Response frame, the associated STA can perform neither OBSS PD based SR nor SRP based SR. However, the current draft says that STA shall not set the TXVECTOR parameter SPATIAL\_REUSE to SRP\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED when it has not received any SRPS element. It makes more sense that a STA not able to do the spatial reuse sets the TXVECTOR parameter SPATIAL\_REUSE to SRP\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED. | Delete the following text:"or if STA has not received a Spatial Reuse Parameter Set element from its associated AP," | Reject – the group has agreed that the default state should be SR enabled on a per-PPDU basis. |
| **13011** | Massinissa Lalam | 27.9. | 308.45 | Given the controversial nature of spatial reuse and its yet to proven gain, I don't think that it is wise to mandate that "if STA has not received a Spatial Reuse Parameter Set element from its associated AP, the STA shall not set the TXVECTOR parameter SPATIAL\_REUSE of any HE PPDU to SRP\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED." In case no instruction are received, the STA should not let its transmissions be potentially impacted by other STAs until it is recommended to do so by the AP and not the other way around. | Replace "If the HESIGA\_Spatial\_reuse\_value15\_allowed subfield of the SR Control field of the most recently received Spatial Reuse Parameter Set element from its associated AP is equal to 0, or if STA has not received a Spatial Reuse Parameter Set element from its associated AP, the STA shall not set the TXVECTOR parameter SPATIAL\_REUSE of any HE PPDU to SRP\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED."with"If the HESIGA\_Spatial\_reuse\_value15\_allowed subfield of the SR Control field of the most recently received Spatial Reuse Parameter Set element from its associated AP is equal to 0, the STA shall not set the TXVECTOR parameter SPATIAL\_REUSE of any HE PPDU to SRP\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED. If the STA has not received a Spatial Reuse Parameter Set element from its associated AP, the STA shall set the TXVECTOR parameter SPATIAL\_REUSE of any HE PPDU to SRP\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED." | Reject – the group has agreed that the default state should be SR enabled on a per-PPDU basis. |
| **11935** | James June Wang | 27.11.6 | 308.50 | ... if the STA is an HE non-AP STA and the SR Disallowed subfield of the SR Control field of the most recently received Spatial Reuse Parameter Set element..." This should be "SRP Disallowed subfield" instead of "SR Disallowed subfield". | as indicated | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 11935 |
| **11936** | James June Wang | 27.11.6 | 308.50 | "or, if permitted, to SRP\_AND-NON-SRG\_OBSS\_PD\_PROHIBITED," this is redudant since the condition for setting SRP\_AND-NON-SRG\_OBSS\_PD\_PROHIBITED is already described in preceding paragragh in line 39-48 | delete "or, if permitted, to SRP\_AND-NON-SRG\_OBSS\_PD\_PROHIBITED," | Reject – the condition is not redundant, but additive. The paragraph at L39-48 offers an option of setting which remains an option even if the condition in the paragraph at L50-54 is met. If the text is deleted from L50-54, then when the condition of L50-54 is met, the option given in L39-48 is not allowed, but the draft wants to allow that option, even under the condition of L50-54. |
| **12273** | kaiying Lv | 27.11.6 | 308.50 | There is no "SR Disallowed subfield " in the SR control field. The SRP Disallowed subfield in the SR Control field indicates whether SRP-based SR transmissions are allowed or not at non-AP STAs that are associated with the AP. So, only TXVECTOR parameter SPATIAL\_REUSE of an HE PPDU shall be set to SRP\_DISALLOW if the HE PPDU does not contain a trigger frame and the HESIGA\_Spatial\_reuse\_value15\_allowed subfield of the SR Control field of the most recently received Spatial Reuse Parameter Set element from its associated AP is equal to 0. | please clarify it | Revise - TGax editor to make changes as shown in 11-18/0026r1 that are marked with CID 12273 |
| **12291** | Kiseon Ryu | 27.11.6 | 308.50 | One more condition to set the TXVECTOR parameter SPATIAL\_REUSE to SRP\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED should be added. | Modify the text as:A STA shall set the TXVECTOR parameter SPATIAL\_REUSE of an HE PPDU to SRP\_DISALLOW or, if permitted, to SRP\_AND-NON-SRG\_OBSS\_PD\_PROHIBITED, if the STA is an HE non-AP STA and the SR Disallowed subfield of the SR Control field of the most recently received Spatial Reuse Parameter Setelement from its associated AP is equal to 1 or ifthe STA has not received a Spatial Reuse Parameter Set element from its associated AP. | Reject – the default condition is that the STA has a choice on the setting, and is only restricted in its choice if the AP makes this restriction by sending the element. In the absence of the AP sending the element, the AP is allowing the STA to have the choice, rather than directing the choice of the STA. |
| **14310** | Yusuke Tanaka | 27.11.6 | 308.50 | This paragraph defines rules for only non-AP STA, but rules for AP should be defined. | Add the following condition at the end."if the STA is an HE AP and the SR Disallowed subfield of the SR Control field of the most recently transmitted Spatial Reuse Parameter Set element is equal to 1" | Reject – the sixth paragraph of the subclause already gives the AP permission to make this setting. There is not and does not need to be a correspondence or dependenct with regard to the setting that the AP imposes upon its member STAs through the SRP Disallowed field value. |
| **14311** | Yusuke Tanaka | 27.11.6 | 308.50 | If non-AP STA has not received a Spatial Reuse Parameter Set element from its associated AP, the non-AP STA shall set the TXVECTOR parameter SPATIAL\_REUSE to SRP\_DISALLOW. | As commented. | Reject – the default condition is that the STA has a choice on the setting, and is only restricted in its choice if the AP makes this restriction by sending the element. In the absence of the AP sending the element, the AP is allowing the STA to have the choice, rather than directing the choice of the STA. |

**Discussion:**

See comments within the proposed resolutions.

**Proposed Changes to Draft Text of TGax D2.0:**

**Definition CIDs**

**3.2 Definitions specific to IEEE 802.11**

***TGax editor: add the following definitions to 3.2 Definitions specific to IEEE 802.11, in the appropriate location within the list of definitions:***

**spatial reuse (SR):** the transmission of a PPDU on the medium under certain conditions when a PPDU reception has been detected that would normally have prevented the transmission**(#13687)**

**non-SRG:** an adjective indicating the quality of not being a member of a particular spatial reuse group, or the quality of not originating from a STA that is a member of a BSS that is part of a particular spatial reuse group**(#14101)**

***TGax editor: change the definitions of DSRP\_PPDU and SRP\_PPDU as follows, reordering the placement of the resulting definition, as needed, within the list of definitions:***

**SRP\_PPDU:** a PPDU that contains a Trigger frame and that has a value other than SRP\_DISALLOW or SRP\_AND\_NON-SRG-OBSS-PD\_PROHIBITED**(#12346)** in the Common Info field SPATIAL\_REUSE. **(#11814)(#11536)(#11703)(#11815) (#11824) (#12024) (#13531) (#13802) (#13856) (#13532) (#13689) (#11357)(#13560) (#13937)**

 **(#11814) (#11536) (#11703) (#11815) (#11824) (#12024) (#13531) (#13802) (#13856) (#13532) (#13689) (#11357)**

***TGax editor: throughout TGax D2.0, change all occurrences of DSRP\_PPDU to SRP\_PPDU*(#11814) (#11536) (#11815) (#11824) (#12024) (#13531) (#13802) (#13856) (#13532) (#13689) (#11357) (#12259)**

***TGax editor: modify the definitions as shown:***

**spatial reused (SR) physical layer (PHY) protocol data unit (PPDU) (SR\_PPDU):** a PPDU that is transmitted during an SRP opportunity by an HE STA when SRP conditions for SRP-based spatial reuse operation are satisfied. **(#11822)(#13688)(#11823)(#12331)(#13130) (#13689) (#11357)**

 **(#11822) (#13688) (#11823)(#12331)(#13130)(#13129) (#13689) (#11357)**

***TGax editor: throughout TGax D2.0, change all occurrences of OBSSPD to OBSS\_PD*(#11744)**

***TGax editor: throughout TGax D2.0, change all occurrences of OBSS-PD to OBSS\_PD*(#11744)**

**3.4 Abbreviations and acronyms**

***TGax editor: add the following acronym definition to 3.4 Abbreviations and acronyms in the appropriate location within the existing list of definitions:***

RPL Received Power Level **(#13832)**

**9.4.2.243 Spatial Reuse Parameter Set element**

***TGax editor: within 9.4.2.243 Spatial Reuse Parameter Set element, modify the text as shown:***

The Spatial Reuse Parameter Set element provides information needed by STAs when performing OBSS\_PD-based spatial reuse as defined in 27.9.2 (OBSS\_PD-based spatial reuse operation) and SRP-based spatial reuse as defined in 27.9.3 (SRP-based spatial reuse operation). **(#11548)** The format of the Spatial Reuse Parameter Set element is defined in Figure 9-589dc (Spatial Reuse Parameter Set element).

The SRP Disallowed subfield in the SR Control field indicates whether SRP-based SR transmissions are allowed or not at non-AP STAs that are associated with the AP that transmitted this element. SRP-based SR transmissions are disallowed when the SRP Disallowed subfield has the value 1. SRP-based SR transmissions are allowed when the SRP Disallowed subfield has the value 0. The SRP Disallowed subfield also affects the value of the SPATIAL\_REUSE parameter of the TXVECTOR as described in 27.11.6 (SPATIAL\_REUSE). **(#12429)**

The Non-SRG OBSS\_PD SR Disallowed subfield in the SR Control field indicates whether non-SRG OBSS\_PD SR transmissions are allowed or not at non-AP STAs that are associated with the AP that transmitted this element. Non-SRG OBSS\_PD SR transmissions are disallowed when the Non-SRG**(#11549)** OBSS\_PD SR Disallowed subfield has the value 1. Non-SRG OBSS\_PD SR transmissions are allowed when the Non-SRG OBSS\_PD SR Disallowed subfield has the value 0.

The Non-SRG Offset Present subfield indicates whether the Non-SRG OBSS PD Max Offset subfield is present in the element. When this bit is set to 1, the Non-SRG OBSS PD Max Offset subfield is present. When this bit is set to 0, the Non-SRG OBSS PD Max Offset subfield is not present.

The SRG Information Present subfield indicates whether the SRG OBSS PD MIN Offset, SRG OBSS PD Max Offset, SRG BSS Color Bitmap and SRG Partial BSSID Bitmap subfields are present in the element. When this bit is set to 1, the SRG OBSS PD Min Offset, SRG OBSS PD Max Offset, SRG BSS Color Bitmap and SRG Partial BSSID Bitmap subfields are present. When this bit is set to 0, the SRG OBSS PD Min Offset, SRG OBSS PD Max Offset, SRG BSS Color Bitmap and SRG Partial BSSID Bitmap subfields are not present.

The HESIGA\_Spatial\_reuse\_value15\_allowed subfield in the SR Control field indicates whether non-AP STAs that are associated with the AP that transmitted this element may set the TXVECTOR parameter SPATIAL\_ REUSE to SRP\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED**(#12232)** SRP-based SR transmissions. The subfield has the value of 0 or 1 and the interpretation of each of these values is described in 27.11.6 (SPATIAL\_REUSE). **(#11550)**

***TGax editor: throughout TGax D2.0, change the permutations of SRP\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED to SRP\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED, where the permutations are created by substituting any number of upper case letters with lower case letters and substituting any number of underscores with hyphens, and having no character between OBSS and PD.* (#12232)**

***TGax editor: throughout TGax D2.0, change all occurrences of UL\_FLAG to UPLINK\_FLAG* (#12458) (#13885)**

***TGax editor: modify the heading of subclause 27.2.3 SRG and non-SRG frame determination as shown:***

**27.2.3 SRG and non-SRG PPDU determination (#14215)**

***TGax editor: within 27.2.3 SRG and non-SRG frame determination, modify the text as shown:***

Identification of SRG and non-SRG PPDUs is used during SRG OBSS\_PD spatial reuse operation as described in 27.9 (Spatial reuse operation). **(#14215)**

An HE non-AP STA that has received a Spatial Reuse Parameter Set element from its associated AP with a value of 1 in the SRG Information Present subfield shall use information provided in the Spatial Reuse Parameter Set element to identify BSSs that are members of the STA's SRG to determine whether or not a received inter- BSS PPDU is an SRG PPDU. An HE AP may use information other than what it has transmitted to other STAs in transmitted Spatial Reuse Parameter Set elements to identify BSSs that are members of the AP's SRG to determine whether or not a received inter- BSS PPDU is an SRG PPDU. **(#13884)**

A received HE PPDU that is an inter-BSS PPDU is an SRG PPDU if the bit in the SRG BSS Color Bitmap field which corresponds to the numerical value of the BSS\_COLOR parameter of the RXVECTOR is set to 1 (see 9.4.2.243 (Spatial Reuse Parameter Set element)). **(#13824)** A received VHT PPDU that is an inter-BSS PPDU is an SRG PPDU if the GROUP\_ID parameter of the RXVECTOR has a value of 0 and the bit in the SRG Partial BSSID Bitmap field which corresponds to the numerical value of PARTIAL\_AID[0:5] of the RXVECTOR is set to 1 (see 9.4.2.243 (Spatial Reuse Parameter Set element)). **(#13824)**

A received PPDU that is an inter-BSS PPDU is an SRG PPDU if BSSID information from an MPDU of the PPDU is correctly received and the bit in the SRG Partial BSSID Bitmap field which corresponds to the numerical value of BSSID[39:44] is set to 1.

A received PPDU that is a VHT MU PPDU with the RXVECTOR parameter UPLINK\_FLAG equal to 1 is an SRG PPDU if the bit in the SRG Partial BSSID Bitmap field which corresponds to the numerical value of bits [39:44] of the RA field of any correctly received MPDU from the PPDU is set to 1. **(#12458) (#13885)**

A received PPDU that is an HE MU PPDU with the RXVECTOR parameter UPLINK\_INDICATION equal to 1 is an SRG PPDU if the bit in the SRG Partial BSSID Bitmap field which corresponds to the numerical value of bits [39:44] of the RA field of any correctly received MPDU from the PPDU is set to 1. **(#12458) (#13885)**

Otherwise, the PPDU is not determined to be an SRG PPDU. An HE non-AP **(#13886)**STA that has not received a Spatial Reuse Parameter Set element from its associated AP with a value of 1 in the SRG Information Present subfield shall not classify any received PPDUs as an SRG PPDU. An HE AP that has not transmitted a Spatial Reuse Parameter Set element with a value of 1 in the SRG Information Present subfield may classify received PPDUs as SRG PPDUs using information that it has not transmitted. **(#13886)**

**27.6.5 HE NDP transmission**

***TGax editor: within 27.6.5 HE NDP transmission, modify the text as shown:***

SPATIAL\_REUSE is set to SRP\_AND\_NON-SRG\_OBSS-PD\_PROHIBITED (see 27.11.6 (SPATIAL\_REUSE)) **(#13945)**

**27.9 Spatial reuse operation**

**27.9.1 General**

The objective of HE spatial reuse operation is to allow the medium to be reused more often between OBSSs in dense deployment scenarios by the early identification of PPDU receptions from overlapping basic service sets (OBSSs) complimented by interference management techniques that are employed to determine whether the transmission of a PPDU can proceed simultaneous to the identified OBSS PPDU reception. **(#13849)**

There are two independent spatial reuse modes, one called OBSS\_PD-based spatial reuse and the other called SRP-based spatial reuse. Within the OBSS\_PD-based spatial reuse mode, there are two types of operation, comprising SRG OBSS\_PD spatial reuse mode and non-SRG OBSS\_PD spatial reuse mode. SRG OBSS\_PD spatial reuse mode transmits spatial reuse PPDUs during the reception of PPDUs from a specific list of OBSSs when interference management determines that such a transmission can be allowed. Non-SRG OBSS\_PD spatial reuse mode transmits spatial reuse PPDUs during the reception of PPDUs from any OBSSs when interference management determines that such a transmission can be allowed. **(#13849)**

**27.9.2 OBSS\_PD-based spatial reuse operation**

**27.9.2.1 General**

***TGax editor: within 27.9.2.1 General, modify the text as shown:***

The RXVECTOR parameter RSSI\_LEGACY in the PHY-RXSTART.indication primitive **(#12716)** is below the Non- SRG OBSS\_PD level (defined in 27.9.2.2 (Adjustment of OBSS\_PD and transmit power)).

***TGax editor: please note that the following change is not a cut and paste error in this comment resolution proposal document, but that there are two identical paragraphs within 27.9.2.1 General which need an identical modification:***

The RXVECTOR parameter RSSI\_LEGACY in the PHY-RXSTART.indication primitive **(#12716)** is below the Non- SRG OBSS\_PD level (defined in 27.9.2.2 (Adjustment of OBSS\_PD and transmit power)).

**27.9.3 SRP-based spatial reuse operation**

***TGax editor: within 27.9.3 SRP-based spatial reuse operation, modify the text as shown:***

 **(#11782) (#13157)**

SRP-based SR opportunities are identified from the value of the RXVECTOR parameter SPATIAL\_REUSE and/or the contents of a Trigger frame. An HE STA may initiate an SR transmission during an SRP-based SR opportunity using an adjusted transmit power level (see 27.9.2.2 (Adjustment of OBSS\_PD and transmit power))**(#11783(#11826)** for the duration of an ongoing PPDU when certain conditions, designed to avoid interfering with the reception of the ongoing PPDU at the recipient are met. When the RXVECTOR parameter SPATIAL\_REUSE of the ongoing PPDU has the value SRP\_DISALLOW or SRP\_ AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED, no SRP-based SR transmission is allowed for the duration of that PPDU.

An HE-STA supporting SRP-based SR\_PPDU transmission indicates this by setting the SRP-based SR Support subfield to 1 in the HE PHY Capabilities Information field of the HE Capabilities element (see Table 9-262aa (Subfields of the HE PHY Capabilities Information field)). An HE-STA supporting SRP-based SR\_PPDU reception indicates this by setting the SR Responder subfield to 1 in the HE MAC Capabilities Information field of the HE Capabilities element (see Table 9-262z (Subfields of the HE MAC Capabilities Information field)). **(#13558)**

An AP sending a Trigger frame may set the SR field in the Common Info field of the Trigger frame to SRP\_DISALLOW or, if permitted, to SRP\_ AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED to forbid OBSS STAs from performing SRP-based SR transmission during the ensuing uplink PPDU**(#11814)(#11536) (#12024)(#11816)** duration. An AP sending a trigger frame shall not set the SR field in the Common Info field of the trigger frame to SR\_DELAY or SR\_RESTRICTED. **(#12192) (#14291)**

***TGax editor: throughout TGax D2.0, change all occurrences of SR PPDU to SR\_PPDU (i.e. change a space to an underscore)* (#13557)(#13563)**

***TGax editor: throughout TGax D2.0, change all occurrences of SRP PPDU to SRP\_PPDU (i.e. change a space to an underscore)* (#12258)**

***TGax editor: throughout TGax D2.0, change all occurrences of SR Responder to SRP Responder, including within field names* (#13936)**

***TGax editor: modify the name of the heading of 27.9.3.1 DSRP\_PPDU-based spatial reuse initiation, as shown:***

**27.9.3.1 SRP-based spatial reuse initiation (#12190)**

***TGax editor: modify text within 27.9.3.1 DSRP\_PPDU-based spatial reuse initiation, as shown:***

An HE STA identifies a DSRP\_PPDU SRP opportunity when the following two conditions are met:

1. The STA receives a PHY-RXSTART.indication corresponding to the reception of a DSRP\_PPDU that is identified as an Inter-BSS PPDU (see 27.2.2 (Intra-BSS and inter-BSS frame determination))
2. An SR\_PPDU is queued for transmission and the intended transmit power of the SR\_PPDU, after normalization to 20 MHz bandwidth (i.e., the transmit power in dBm minus the value, in dB of the intended transmit bandwidth divided by 20 MHz), is below the value of SRP minus RPL, where SRP is the value obtained from Table 28-22 (Spatial Reuse subfield encoding for an HE TB PPDU)**(#13561)(#11820)(#12254)** based on at least one of:
3. The value of the Spatial Reuse information of the common info field of the Trigger frame of the DSRP\_PPDU **(#12071)(#13562)**
4. The value of the Spatial Reuse information of the SIGA SRP field of the HE TB PPDU that follows the DSRP\_PPDU**(#12071) (#13562)**

and the value of RPL is the received power level of the legacy portion of the DSRP\_PPDU, normalized to 20 MHz bandwidth. **(#12071) (#13562)**

A STA that identifies an SRP opportunity due to the receipt of a DSRP\_PPDU may eschew the NAV update operations normally executed based on the receipt of the RXVECTOR parameter TXOP\_DURATION and the Trigger frame DUR field value. See Figure 27-11 (DSRP\_PPDU spatial reuse). A STA that identifies an SRP opportunity due to the receipt of a DSRP\_PPDU may ignore the PHY-RXSTART.indication and the associated HE TB PPDU(s) that are triggered by the Trigger frame of the DSRP\_PPDU and that occurs within aSIFSTime + aRxPHYStartDelay + 2  aSlotTime of the end of the last symbol on the air of the PPDU that contained the Trigger frame, provided that the value of the BSS\_COLOR parameter of the RXVECTOR of the HE TB PPDU**(#11560)** matches the BSS color of the DSRP\_PPDU. A STA that identifies an SRP opportunity due to the receipt of a DSRP\_PPDU shall not transmit an SR PPDU that terminates beyond the PPDU duration of the HE TB PPDU that is trig-gered by the Trigger frame of the DSRP\_PPDU.

In cases when condition 2) above is not met because there is no SR\_PPDU queued for transmission, an HE STA supporting SRP-based SR\_PPDU reception shall calculate the maximum allowed transmit power per condition 2) above and obey that transmit power limit for all responses transmitted to received SR\_PPDUs during the time that ends at the end of the HE TB PPDU that is triggered by the DSRP\_PPDU identified above. **(#14300) (#12074) (#14121)**

**27.9.3.5 SR\_PPDU reception and response transmission requirements**

An HE STA that receives a PPDU which contains at least one MPDU with an SR\_PPDU Indication subfield value equal to 1 shall not transmit a response PPDU elicited by the received PPDU if all outstanding SRP and OBSS\_PD transmit power requirements are not met by the response transmission.

**27.9.4 Interaction of OBSS\_PD and SRP-based spatial reuse**

An HE STA with dot11HESRPOptionImplemented set to true that receives a PPDU that is identified as an inter-BSS PPDU with a value other than SRP\_DISALLOW for the RXVECTOR parameter SPATIAL\_REUSE and fails to identify an SRP Opportunity based on the receipt of the PPDU shall use a value of 82 dBm/20 MHz or lower for the *OBSS\_PDlevel* as it applies to this PPDU.

An HE STA with dot11HESRPOptionImplemented set to true that receives a PPDU that is identified as an inter-BSS PPDU with a value other than SRP\_DISALLOW or SR\_DELAY for the RXVECTOR parameter SPATIAL\_REUSE and identifies an SRP opportunity based on the receipt of the PPDU may use a value of positive infinity or lower for the *OBSS\_PDlevel* as it applies to this PPDU and may use a value equal to the receive power of this PPDU plus 1 dB for the ED level for the duration of this PPDU.

An HE STA with dot11HESRPOptionImplemented set to true that receives a PPDU that is identified as an inter-BSS PPDU with a value other than SRP\_DISALLOW in the Common Info Field SPATIAL\_REUSE of a Trigger frame and fails to identify an SRP opportunity based on the receipt of the PPDU shall use a value of 82 dBm/20 MHz or lower for the *OBSS\_PDlevel* as it applies to the HE TB PPDU that is elicited by the Trigger frame.

An HE STA with dot11HESRPOptionImplemented set to true that receives a PPDU that is identified as an Inter-BSS PPDU with a value other than SRP\_DISALLOW**(#12198)** in the Common Info Field SPATIAL\_REUSE of a Trigger frame and identifies an SRP opportunity based on the receipt of the PPDU may use a value of positive infinity or lower for the *OBSS\_PDlevel* as it applies to the payload portion of the**(#12200)** HE TB PPDU that is elicited by the Trigger frame and may use a value equal to the receive power of the HE TB PPDU plus 1 dB for the ED level for the duration of the HE TB PPDU. **(#12202)**

An HE STA with dot11HESRPOptionImplemented set to true that receives a PPDU that is identified as an inter-BSS PPDU with a value equal to SR\_DELAY for the RXVECTOR parameter SPATIAL\_REUSE shall use a value of negative infinity for the *OBSS\_PDlevel* as it applies to this PPDU. **(#12204)**

***TGax editor: modify the name of the heading of 27.9.3.2 SRP\_PPDU-based spatial reuse backoff procedure, as shown:***

**27.9.3.2 SRP-based spatial reuse backoff procedure (#12190)**

***TGax editor: modify text within 27.9.3.2 SRP\_PPDU-based spatial reuse backoff procedure, as shown:***

If an HE STA identifies an SRP opportunity as allowed in 27.9.3.1 (DSRP\_PPDU-based spatial reuse initia-tion), the HE STA may continue the countdown of an existing backoff procedure provided that the medium condition is not otherwise indicated as BUSY. If the HE STA receives another PPDU during the back-off procedure, it shall suspend its back-off and subsequently, if an SRP opportunity is identified based on the identification of the new PPDU as an SRP\_PPDU, then**(#11825)** the STA may resume its backoff procedure. The TXOP that the HE STA gains once its backoff reaches zero shall not extend beyond the SRP opportunity endpoint which is the earliest ending of all of the durations of all of the SRP\_PPDUs that were used to confirm the SRP opportunity and all of the durations indicated in the Common Info fields of Trigger frames within all DSRP\_PPDUs that were used to confirm the SRP opportunity.

If the HE-STA is employing *OBSS\_PDlevel* as a threshold for deter-mination of an IDLE medium condition prior to the reception of an SRP\_PPDU per the rules specified in 27.9.2 (OBSS\_PD-based spatial reuse operation) **(#12261)(#11826)**, the intended transmit power of the next SR\_PPDU in the transmission queue as measured at the output of the antenna connector shall be equal to or lower than the TXPWRmax, calculated with this specific *OBSS\_PDlevel* using Equation (27-4). **(#11561)(#13564)**

After a STA has identified the start of an SRP Opportunity, and until the SRP Opportunity Endpoint is reached, the transmission of any PPDU by the STA shall be limited by the transmit power restrictions iden-tified in 27.9.3 (SRP-based spatial reuse operation).

**27.9.3.3 Spatial Reuse field of Trigger frame**

***TGax editor: modify text within 27.9.3.3 Spatial Reuse field of Trigger frame, as shown:***

An AP with dot11HESRPOptionImplemented set to true that transmits a Trigger frame may determine the value of the Spatial Reuse field value of the Common Info field of the Trigger frame in each 20 MHz band-width for 20 MHz, 40 MHz, 80 MHz PPDU or in each 40 MHz bandwidth for 80+80 or 160 MHz PPDU by selecting the row in Table 28-22 (Spatial Reuse subfield encoding for an HE TB PPDU) **(#11827)** that has a numerical value in the column labeled "Meaning" that is the highest value that is equal to or below the value of the computed MAC parameter SRP\_INPUT as follows:

SRP\_INPUT = *TXPWRAP* + Acceptable Receiver Interference LevelAP (27-5)

Where

*TXPWRAP* is the transmit power in dBm at the output of the antenna connector of the AP sending the Trig-ger frame normalized to 20 MHz bandwidth (i.e., transmit power in dBm minus transmit band-width divided by 20 MHz bandwidth in dB) for each 20 MHz transmit bandwidth for 20 MHz, 40 MHz, and 80 MHz PPDU or in each of the 40 MHz transmit bandwidths for an 80+80 MHz or 160 MHz PPDU.

Acceptable Receiver Interference LevelAP is a value in dBm normalized to a 20 MHz bandwidth (i.e., minus transmit bandwidth divided by 20 MHz bandwidth in dB) for each 20 MHz transmit bandwidth for 20 MHz, 40 MHz, and 80 MHz PPDU or in each of the 40 MHz transmit band-widths for an 80+80 MHz or 160 MHz PPDU and should be set to the ambient noise plus inter-ference power level observed at the AP immediately prior to the transmission of the trigger frame plus the minimum**(#12193)** SNR margin value which yields a 10% PER for all of the intended MCS(s) in the ensuing uplink HE TB PPDU, minus a safety margin value not to exceed 5 dB as deter-mined by the AP.

An AP with dot11HESRPOptionImplemented set to true that transmits a trigger frame may set the value of the Spatial Reuse field value of the Common Info field of the trigger frame in each 20MHz bandwidth for 20 MHz, 40 MHz, 80 MHz PPDU or in each 40 MHz bandwidth for 80+80 or 160 MHz PPDU to SRP\_- DISALLOW.

An AP with dot11HESRPOptionImplemented set to false that transmits a trigger frame shall set the value of the Spatial Reuse field value of the Common Info field of the trigger frame in each 20 MHz bandwidth for 20 MHz, 40 MHz, 80 MHz PPDU or in each 40 MHz bandwidth for 80+80 or 160 MHz PPDU to SRP\_- DISALLOW.

**27.9.3.4 SR\_PPDU transmission requirements**

An HE STA that identifies an SRP opportunity shall not transmit a PPDU during the SRP opportunity that elicits a response transmission from a STA from which it has not received an HE Capabilities element with the SR Responder field equal to 1. An HE STA that identifies an SRP opportunity shall not transmit an MPDU that elicits a response transmission during that SRP opportunity that does not include an A-Control field with the SR\_PPDU Indication subfield value set to 1.

**27.11.6 SPATIAL\_REUSE**

***TGax editor: within 27.11.6 SPATIAL\_REUSE, modify the text as shown:***

The contents of the Spatial Reuse field are carried in the TXVECTOR parameter SPATIAL\_REUSE for an HE PPDU indicating spatial reuse information (See 27.9.3 (SRP-based spatial reuse operation)).

For a PPDU with a value of HE\_TRIG for the TXVECTOR parameter FORMAT, the SPATIAL\_REUSE parameter contains an array of four values. The first value in the array is the SPATIAL\_REUSE parameter that applies to the lowest frequency 20 MHz subband, the second value in the array applies to the second lowest frequency 20 MHz subband, the third value in the array applies to the third lowest frequency 20 MHz subband and the fourth value in the array applies to the highest frequency 20 MHz subband when the CH\_BANDWIDTH parameter has the value of CBW20, CBW40 or CBW80. The first value in the array applies to the lowest frequency 40 MHz subband, the second value in the array applies to the second lowest frequency 40 MHz subband, the third value in the array applies to the third lowest frequency 40 MHz subband and the fourth value in the array applies to the highest frequency 40 MHz subband when the CH\_BANDWIDTH parameter has the value of CBW160 or CBW80+80. When the SPATIAL\_REUSE parameter is an array, each value in the array shall individually conform to the rules in this subclause.

An AP with dot11HESRPOptionImplemented set to true that transmits an HE ER PPDU should set the TXVECTOR parameter SPATIAL\_REUSE to SRP\_DISALLOW.

A non-AP STA with dot11HESRPOptionImplemented set to true that transmits an HE SU PPDU, HE ER PPDU or HE MU PPDU may **(#12269)**set the TXVECTOR parameter SPATIAL\_REUSE to SRP\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED when the HESIGA\_Spatial\_reuse\_value15\_allowed sub-field of the SR Control field of the most recently received Spatial Reuse Parameter Set element from its associated AP is equal to 1. **(#12271)(#11868)(#14308)**Otherwise, the non-AP STA shall set it to SRP\_DISALLOW.

An HE STA that transmits an HE TB PPDU determines the value of the TXVECTOR parameter SPATIAL\_ REUSE according to 27.5.3.3 (STA behavior for UL MU operation).

An HE AP with dot11HESRPOptionImplemented set to true may set the TXVECTOR parameter SPATIAL\_ REUSE of an MSDU, A-MPDU or MMPDU to the value SRP\_DISALLOW to forbid OBSS STAs from performing SRP-based SR transmission during the duration of the corresponding HE SU PPDU, HE ER SU PPDU, or HE MU PPDU.

An HE STA shall set the TXVECTOR parameter SPATIAL\_REUSE to SRP\_AND\_NON-SRG\_OBSSPD\_ PROHIBITED for an NDP PPDU.

An HE STA shall set the TXVECTOR parameter SPATIAL\_REUSE to SRP\_AND\_NON-SRG\_OBSSPD\_ PROHIBITED for a PPDU containing an FTM or NDP Announcement frame and in any frame that is transmitted as a response to an FTM or NDP Announcement frame. **(#13945)**

An HE STA that transmits an HE SU PPDU or an HE ER SU PPDU that contains a Trigger frame should set the TXVECTOR parameter SPATIAL\_REUSE to SR\_DELAY.

An HE STA that transmits an HE MU PPDU that contains a Trigger frame should set the TXVECTOR parameter SPATIAL\_REUSE to SR\_RESTRICTED.

An HE STA that transmits an HE SU PPDU or HE ER SU PPDU shall not set the TXVECTOR parameter SPATIAL\_REUSE to SR\_RESTRICTED.

An HE STA that transmits an HE MU PPDU shall not set the TXVECTOR parameter SPATIAL\_REUSE to SR\_DELAY.

An HE STA that transmits a PPDU that does not contain a Trigger frame shall not set the TXVECTOR parameter SPATIAL\_REUSE to SR\_DELAY or SR\_RESTRICTED.

An HE STA with dot11HESRPOptionImplemented set to false may set the TXVECTOR parameter SPATIAL\_ REUSE to SRP\_DISALLOW for any PPDU that is not an HE TB PPDU or an NDP PPDU or a PPDU containing an FTM or NDP Announcement frame and that is not a frame that is transmitted as a response to an FTM or NDP Announcement frame. **(#13946)**

An HE non-AP STA may set the TXVECTOR parameter SPATIAL\_REUSE of an HE PPDU to SRP\_AND\_NON\_SRG\_OBSS\_PD\_PROHIBITED if the HESIGA\_Spatial\_reuse\_value15\_allowed subfield of the SR Control field of the most recently received Spatial Reuse Parameter Set element from its associated AP is equal to 1. If the HESIGA\_Spatial\_reuse\_value15\_allowed subfield of the SR Control field of the most recently received Spatial Reuse Parameter Set element from its associated AP is equal to 0, or if STA has not received a Spatial Reuse Parameter Set element from its associated AP, the STA shall not set the TXVECTOR parameter SPATIAL\_REUSE of any HE PPDU to SRP\_AND\_NON\_SRG\_OBSS\_PD\_ PROHIBITED, unless the HE PPDU contains an NDP, an FTM or an NDP Announcement frame or is a frame that is transmitted as a response to an FTM or NDP Announcement frame. **(#12549)**

A STA shall set the TXVECTOR parameter SPATIAL\_REUSE of an HE PPDU to SRP\_DISALLOW or, if permitted as per the other rules within this subclause, **(#11932)** to SRP\_AND-NON-SRG\_OBSS\_PD\_PROHIBITED, if the STA is an HE non-AP STA and the SRP**(#12429) (#11935) (#12273)** Disallowed subfield of the SR Control field of the most recently received Spatial Reuse Parameter Set element from its associated AP is equal to 1.

**End of proposed changes.**