IEEE P802.11  
Wireless LANs

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| CC40 CR for MLME – Part 1 | | | | |
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**Abstract**

This document proposes comment resolutions for the following CIDs, which are related to the illustration of the message flow in Figure 6-28a, b, c and d in Draft 0.2

* 211, 212, 213, 214, 371, 824, 731, 35, 388, 733, 468, 469, 658, 659, 826, 827, 829, 820, 822, 389, 825, 732, 821, 484

R0: Initial version.

R1: Made changes to CR for CID 732, based on offline discussions.

R2: Made changes to CR for CID 824, 35, 468, 469, 658, 659, 826, 827, 829, 389, 822, 484 and 825, based on discussions during the TGbf call on 23 Aug. SP is added.

R3: Made changes to CR for CID 35, 822, 468, 469, 658, 659 , based on discussions during Sept. Interim.

# CID 211, 212, 213, 214, 371, 824

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| **CID** | **Subclause** | **Page** | **Comment** | **Proposed Change** |
| 211 | 6.3.134.1 | 18.33 | Some labels in Figure 6-28a use an acronym (SENS) that is not defined in the draft. | Replace SENS with Sensing. |
| 212 | 6.3.134.1 | 19.01 | Some labels in Figure 6-28b use an acronym (SENS) that is not defined in the draft. | Replace SENS with Sensing. |
| 213 | 6.3.134.1 | 19.37 | Some labels in Figure 6-28c use an acronym (SENS) that is not defined in the draft. | Replace SENS with Sensing. |
| 214 | 6.3.134.1 | 20.3 | Some labels in Figure 6-28d use an acronym (SENS) that is not defined in the draft. | Replace SENS with Sensing. |
| 371 | 6.3.134.1 | 18.64 | In Figure 6-28a, the frames are not correct during the measurement setup. "SENS Measurement Setup Request/Response" should be "Sensing Measurement Setup Request/Response". In addition, the same should be applied to the other figures. | As in the comment. |

**Proposed resolution**: Accepted.

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| **CID** | **Subclause** | **Page** | **Comment** | **Proposed Change** |
| 824 | 6.3.134.1 | 19.31 | "TB measurement instance" and "TB sensing measurement instance" are used interchangeably through the document. There are more occurrences of "TB sensing measurement instance" and it is suggested to keep this term. Same applies to "non-TB measurement instance" vs "non-TB sensing measurement instance" | Change "TB measurement instance" to "TB sensing measurement instance" and "non-TB measurement instance" to "non-TB sensing measurement instance" in the following places:  Pg. 19 caption of Figure 6-28b  Pg. 19 caption of Figure 6-28c |

**Proposed resolution**: Revised.

**Discussion**: This comment is resolved by CID #819 and CID #828, and is already approved to be included in Draft 0.2.

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The proposed **modification** is to make a global change throughout Draft 0.2.

## *TGbf Editor: Please replace all occurrences of “TB measurement instance” with “TB sensing measurement instance” in Draft 0.2.*

# CID 731, 35

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| **CID** | **Subclause** | **Page** | **Comment** | **Proposed Change** |
| 731 | 6.3.134.1 | 18.45 | In Figure 6-28a, the report phase can be optional. Either make Trigger report and sensing measurement report arrows with dash line or write optional under each text. | The baseline spec has the word optional under the text (refer to 6.3.57.1 BSSTransition Management Procedure) while the 11az spec uses dash line (Figure 6-17a and 6-17b). |
| 35 | 6.3.134.1 | 18.56 | Measurement Setup Termination frame can be an action frame or action no ack frame. The Ack after SENS Measurement Setup Termination frame is unnecessary in Figure 6-28a,b,c,d. | Change the solid line to dashed line to indicate that it is optional. |

**Proposed resolution:** Revised.

**Discussions:**

1. **#731**: I agree with this comment. In Figure 6-28a, the optional frame exchanges and the associated primitive exchanges are not indicated by dashed lines as done in Figure 6-28b-d. So, the proposed **modifications** are shown on Page 12 in this document:
2. To use dashed lines (as done in 11az spec) for optional frames and primitives in Figure 6-28a.
3. The current dashed lines in Figure 6-28b-d are difficult to identify, and thus, a new type of dashed line is used in Figure 6-28a-d.
4. **#35**: Based on offline discussions, we’ve agreed that the termination of a measurement setup can benefit from receiving the Ack. There exist a specific case where the termination frame may be sent without an Ack, that is when AP wants to terminate the measurement setup with a U-STA in the non-TB case. The proposed **modifications** are
   1. Use dashed line for [Ack](#_TGbf_Editor:_Please) in the non-TB case where AP sends the termination frame to indicate “optional”.

* There are comments saying that making Ack optional may confuse people to think that the receiver can choose whether or not to send the Ack. I agree with the commenter that whether or not to send the Ack is determined by the transmitter in the sent frame (e.g., as indicated by Ack Policy Indicator in MAC header), not by the receiver.
* The arc is used to indicate the cause-and-effect relationship of frames, which is also added to the Draft for explaination. So, I would like to use **arc** to clarify this confusion in order to indicate that the Ack is a result of the termination frame.
* The MLME-SENSMSMTTERMINATION.confirm primitive is also issued when Ack is not required. So, solid line is used.
  1. Insert a [text](#_9.6.7.52_Sensing_Measurement) to subclause 9.6.7.52 Sensing Measurement Setup Termination frame format.

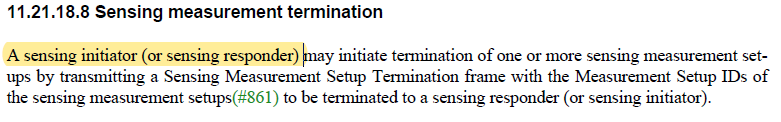
# CID 388, 733

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| **CID** | **Subclause** | **Page** | **Comment** | **Proposed Change** |
| 388 | 6.3.134.1 | 18.59 | In Figures 6-28a-d, it is unclear why a SENS Measurement Setup Termination frame is sent by the sensing responder. Based on the description in Subclause 11.21.18.8, a sensing measurement setup is terminated upon the transmission of a Sensing Measurement Setup Termination frame by the sensing initiator. | Modify Figures 6-28a-d by removing the SENS Measurement Setup Termination frame and ACK frame sent by the sensing responder and sensing initiator, respectively |
| 733 | 6.3.134.1 | 20.33 | Figures 6-28c and 6-28d shows flow for downlink, downlink + uplink respectively. Should we add a new figure for uplink only case for NTB? | As per comment |

**Proposed resolution:** Rejected.

**Discussion:**

1. **#388**: In subclause 11.21.18.8, it is explicitly stated that



1. **#733**: Figure 6-28b shows the uplink case for non-TB.

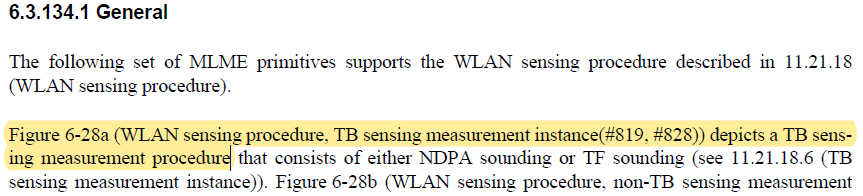


# CID 820, 822

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| **CID** | **Subclause** | **Page** | **Comment** | **Proposed Change** |
| 820 | 6.3.134.1 | 18.32 | Figure 6-28a caption refers to a TB measurement instance, however a TB measurement instance does not include measurement setup phase and measurement termination phase, which are not part of a TB measurement instance (see Figure 11-41c for examples of TB sensing measurement instance. | Changes to apply to Figure 6-28a:  Option 1 - Remove the SENS Measurement Setup Request frame and SENS Measurement Setup Response frame, as well as the SENS Measurement Setup Termination frame and corresponding Ack from the figure.  Option 2 - Put a large square around the aspects of Figure 6-28a that are related to a TB sensing measurement instance and identify such in a legend.  Option 3 - Change the caption for Figure 6-28a to "WLAN sensing procedure, measurement setup and termination and TB sensing measurement instance." |

**Proposed resolution**: Rejected.

**Discussion**:

The caption of Figure 6-28a refers to a WLAN sensing procedure, which consists of a TB sensing measurement instance. Figure 6-28a is to show the complete TB variant of a WLAN sensing procedure, not only a sensing measurement instance. The sensing measurement setup phase and termination phase shall not be removed from the figure because these phases are part of the TB sensing procedure and also introduce the new primitives used in sensing. Finally, in my mind, the caption need to highlight the key point, not to elaborate all phases/steps.

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| **CID** | **Subclause** | **Page** | **Comment** | **Proposed Change** |
| 822 | 6.3.134.1 | 18.33 | Dashed ovals in figure 6-28a are confusing, and there is no legend identifying why some transactions are circled and others not. | Changes to apply to Figure 6-28a:  - Add legend to identify that dashed ovals represent message exchanges for each different phase of a TB measurement instance.  - Add ovals around Polling Phase, NDPA sounding phase, TF sounding phase, Reporting phase  - Remove ovals around sensing measurement setup termination message exchanges.  - Figure 6-28a shows two termination options. Remove one, as it is not relevant for Figure 6-28a that both sides may optionally initiate a termination. |

**Proposed resolution**: Revised.

**Discussion**:

I agree with this comment that without any instruction the dashed ovals are confusing. The proposed **modifications** is to identify each phase of a TB sensing measurement instance by adding the phase name inside the [ovals](#_TGbf_Editor:_Please_1). The two termination phases are kept in the figures, to show that either the sensing initiator or responder can initiate the termination phase.

For the non-TB case, there is only one sounding allowed that is the NDPA sounding. So, I labelled “NDPA sounding” in the figure for each possible variant of a non-TB sensing measurement instance **depending on the role of the sensing responder**. To differentiate three “NDPA sounding”, I added some texts as follows.

## *TGbf Editor: Please modify the following text at L21P19 in subclause 6.3.134.1.*

Figure 6-28b (WLAN sensing procedure~~,~~  with a non-TB sensing measurement instance(#819, #828~~) with uplink sounding~~, #389, #825, #212, #371, #731, #35, #822, #826, #827, #828))~~, Figure 6-28c (WLAN sensing procedure, non-TB sensing measurement instance(#819, #828) with downlink sounding), and Figure 6-28d (WLAN sensing procedure, non-TB sensing measurement instance(#819, #828) with both uplink and downlink sounding)~~ depicts a non-TB sensing measurement procedure~~s~~ that consists of ~~uplink sounding, downlink sounding, and both uplink and downlink sounding, respectively~~ NDPA sounding with SI2SR NDP or SR2SI NDP or both SI2SR NDP and SR2SI NDP(see 11.21.18.7 (Non-TB sensing measurement instance)) (#822). These figures are examples of basic procedures and are not meant to be exhaustive of all possible uses of the protocol.

## *TGbf Editor: Please insert the following text after Figure 6-28b.*

In Figure 6-28b(WLAN sensing procedurewith a non-TB sensing measurement instance), if the sensing responder is assigned the role of sensing receiver only, the SI2SR NDP is used to obtain sensing measurements. In this case, the SR2SI NDP that is sent by the sensing responder in response to the received Sensing NDPA frame and subsequent SI2SR NDP is not shown in the figure (see 11.21.18.7 (Non-TB sensing measurement instance)). If the sensing responder is assigned the role of sensing transmitter only, the SR2SI NDP is used to obtain sensing measurements. In this case, the SI2SR NDP that is sent following the Sensing NDPA frame is not shown in the figure (see 11.21.18.7 (Non-TB sensing measurement instance)). If the sensing responder is assigned the roles of sensing transmitter and sensing receiver, both SI2SR NDP and SR2SI NDP are used to obtain sensing measurements. (#822)

# CID 732, 821

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| **CID** | **Subclause** | **Page** | **Comment** | **Proposed Change** |
| 732 | 6.3.134.1 | 00.00 | Add a new Figure for TB measurement instant to show both NDPA sounding and TF sounding or add text that shows that mode as the current text for 6-28a indicates either/or condition and not both | As per comment |
| 821 | 6.3.134.1 | 18.20 | Figure 6-28a depicts BOTH NDPA sounding AND TF sounding exchanges, however text identifies EITHER NDPA sounding OR TF sounding. | Change text to: "Figure 6-28a (WLAN sensing procedure, TB measurement instance) depicts aspects of a TB sensing procedure, including sensing measurement setup, sensing polling, NDPA sounding and TF sounding (see 11.21.18.6 (TB sensing measurement instance)). |

**Proposed resolution:** Revised.

**Discussions:**

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Based on offline discussions, the intention of these comments is to clarify that a TB sensing measurement instance can consist of NDPA sounding or TF sounding or both which should be reflected by texts or the figure. However, Figure 6-28 highlights only the “either/or” case. The proposed **modification** is to add one [sentence](#_6.3.134.1_General) in subclause 6.3.134.1.

# CID 825

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| **CID** | **Subclause** | **Page** | **Comment** | **Proposed Change** |
| 825 | 6.3.134.1 | 19.04 | Figures 6-28b, 6-28c, and 6-28d can be simplified and combined into a single figure illustrating a non-TB measurement instance example. Difference is 6-28b illustrates "Uplink", 6-28c "Downlink", and 6-28d "Both". Setup and termination is common to all three. Usage of dashed ovals in single figure can identify the three differences. | Remove Figure 6-28b and Figure 6-28c and make changes to Figure 6-28b in line with those applied to Figure 28.6a:  - Add legend to identify that dashed ovals represent message exchanges for each different phase of a non-TB measurement instance.  - Combine figures 6-28b, 6-28c, and 6-28d into single figure to consist of sensing measurement setup, followed by "I2R", then "R2I", then "Both". Add legend, and use dashed oval to identify each of the three options.  Finally, figures contain two termination options. Remove one, since termination is not relevant to the non-TB measurement instance. |

**Proposed resolution**: Revised.

**Discussion:** I agree with this comment in principle. Figure 6-28b-d can be combined into a single figure including all cases of a non-TB sensing measurement instance like Figure 6-28a. The proposed **modifications** are to replace Figure 6-28b-d with a new [figure](#_TGbf_Editor:_Please) and modify the corresponding text in 6.3.134.1. General.

# CID 468, 469, 658, 659

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| **CID** | **Subclause** | **Page** | **Comment** | **Proposed Change** |
| 468 | 6.3.134.1 | 19.14 | Figure 6-28b contradicts to text description of non-TB sensing measurement instance in 11.21.18.7, page 71, line 61-65. For completeness of MLME procedure illustration, the transmission of unused NDP should be added back. | Add R2I NDP transmission for completeness of MLME procedure illustration. |
| 469 | 6.3.134.1 | 19.45 | Figure 6-28c contradicts to text description of non-TB sensing measurement instance in 11.21.18.7, page 71, line 61-65. For completeness of MLME procedure illustration, the transmission of the unused NDP should be added back. | Add I2R NDP transmission for completeness of MLME procedure illustration |
| 658 | 6.3.134.1 | 19.13 | The procedure misses the R2I NDP | The non-TB Sensing procedure includes two NDPs. The R2I NDP shall also be included in this figure 6-28b. |
| 659 | 6.3.134.1 | 19.46 | The procedure misses the I2R NDP | The non-TB Sensing procedure includes two NDPs. The I2R NDP shall also be included in this figure 6-28c. |

**Proposed resolution:** Revised.

**Discussion:**

1. Figure 6-28b and Figure 6-28c are showing the cases where the sensing is unidirectional. This means that the R2I NDP and I2R NDP, which are not shown in Figure 6-28b and Figure 6-28c, respectively, do not contribute to performing the sensing measurements. No primitives are initiated by the R2I NDP in Figure 6-28b or the I2R NDP in Figure 6-28c.
2. The purpose of showing only the active NDP(s) in Figure 6-28b-d is to highlight the NDP that is used to obtain non-TB sensing measurements, distinguishing three types of non-TB sensing instances depending on the role of the sensing responder.
3. The proposed change is to keep the message flow shown in the figure as it is. To clarify the confusion, texts are added. **Please refer to the CR for CID#822.**

# CID 826, 827, 829, 389

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| **CID** | **Subclause** | **Page** | **Comment** | **Proposed Change** |
| 826 | 6.3.134.1 | 19.30 | Figure 6-28b caption contains "uplink sounding", however uplink sounding is not defined in non-TB measurement instance description. Text uses I2R. Figure 6-28c caption contains "downlink sounding", however downlink sounding is not defined in non-TB measurement instance description. Text uses R2I. | Change Figure 6-28d caption to  "WLAN sensing procedure, non-TB measurement instance with I2R and R2I." |
| 827 | 6.3.134.1 | 19.62 | Figure caption contains "downlink sounding", however downlink sounding is not defined in non-TB measurement instance description. Text uses R2I. | Replace "downlink sounding" with "R2I" |
| 829 | 6.3.134.1 | 20.31 | Figure caption contains "uplink sounding" and "downlink sounding", however terms are not defined in non-TB measurement instance description. Text uses I2R and R2I. | Replace "uplink sounding" with "I2R", and replace "downlink sounding" with "R2I" |
| 389 | 6.3.134.1 | 18.65 | The writing of the captions of Figures 6-28a-d can be improved | Change the caption of Figure 6-28a to: 'A TB measurement instance of a WLAN sensing procedure'. The same change can be done to the captions of Figures 6-28b-d |

**Proposed resolution:** Revised.

**Discussion:** I agree with the comments of #826, CID # 827 and CID #829 that “uplink sounding” and “downlink sounding” are not defined in WLAN sensing procedure. I also agree with the comment of #389 in principle to revise the captions. So the proposed **modifications** are

1. ~~Replace “uplink sounding” with “[SI2SR](#_TGbf_Editor:_Please) sounding” and “downlink sounding” with “SR2SI sounding”, and~~ Only NDPA sounding is allowed in non-TB cases. So all appearances of “uplink sounding” and “downlink sounding” are removed from the text. Please also refer to CR for CID#822.
2. Add “SI2SR” and “SR2SI” to “NDP” in figures correspondingly for consistency.
3. Modify the captions.

## *TGbf Editor: Please replace all occurrences of captions of Figure 6-28a and 6-28b in Draft 0.2 with the modified captions.*

Figure 6-28a—WLAN sensing procedure~~,~~ with a TB sensing measurement instance (#819, #828, #389)

Figure 6-28b –WLAN sensing procedure~~,~~ with a non-TB sensing measurement instance (#819, #828, #389, #825) ~~with uplink sounding~~

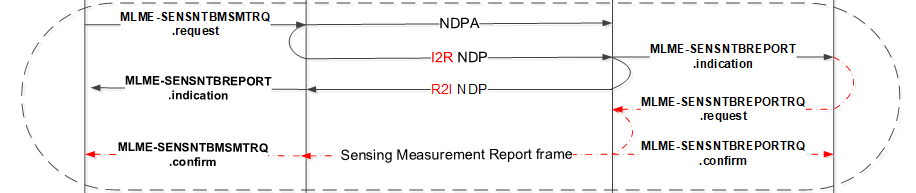
# CID 484

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| **CID** | **Subclause** | **Page** | **Comment** | **Proposed Change** |
| 484 | 6.3.134.1 | 18.40 | The lines between SENS Poll frame and SENS NDPA frame, NDP, SENS Report Trigger frame, SENS Trigger frame in Figure 6-28a are confusing. What are those lines mean? | Remove those lines unless specified otherwise. |

**Proposed resolution**: Revised.

**Discussion:** I agree with this comment that the arcs between frames can be confusing without an appropriate explanation. According to Solomon – “*The purpose of the arcs is to demonstrate that the frames are initiated by the same MLME primitive. The primitive contains all the parameters needed to transmit the corresponding frames.*” I think that the arcs are useful and shall be kept. The proposed **modification** are

1. Add [texts](#_TGbf_Editor:_Please_3) at the end of Figure 6-28a to explain the use of the arcs for reading instructions.
2. Remove the arc that connects the SI2SR NDP and the SR2SI NDP. Use texts to explain that R2I NDP is configured by the NDPA frame after Figure 6-28b.



## *TGbf Editor: Please add the following text after Figure 6-28a.*

In Figure 6-28a (WLAN sensing procedure with a TB sensing measurement instance) and Figure 6-28b (WLAN sensing procedure with a non-TB sensing measurement instance), the arc that connects a primitive with a frame at MLME indicates that this primitive initiates the transmission of the connected frame and contains all the parameters needed to configure the frame, and the arc that connects frames at MLME indicates that the preceding frame initiates the transmission of the subsequent frame and contains all the parameters needed to configure the subsequent frame. (#484)

## *TGbf Editor: Please add the following text after Figure 6-28b.*

In Figure 6-28b (WLAN sensing procedure with a non-TB sensing measurement instance), the Sensing NDPA frame shall configure the SR2SI NDP that is sent by the sensing responder after receiving the Sensing NDPA frame and subsequent SI2SR NDP. (#484)

# All Modifications

# 6.3.134.1 General

The following set of MLME primitives supports the WLAN sensing procedure described in 11.21.18 (WLAN sensing procedure).

Figure 6-28a (WLAN sensing procedure~~,~~  with a TB sensing measurement instance (#819, #828, #211, #371, #731, #822, #389, #824, #829)) depicts a TB sensing measurement procedure that consists of either NDPA sounding or TF sounding (see 11.21.18.6 (TB sensing measurement instance)). This figure also shows a TB sensing measurement procedure that consists of both NDPA sounding and TF sounding.(#732, #821) Figure 6-28b (WLAN sensing procedure~~,~~  with a non-TB sensing measurement instance(#819, #828~~) with uplink sounding~~, #389, #825, #212, #371, #731, #35, #822, #826, #827, #828))~~, Figure 6-28c (WLAN sensing procedure, non-TB sensing measurement instance(#819, #828) with downlink sounding), and Figure 6-28d (WLAN sensing procedure, non-TB sensing measurement instance(#819, #828) with both uplink and downlink sounding)~~ depicts a non-TB sensing measurement procedure~~s~~ that consists of ~~uplink sounding, downlink sounding, and both uplink and downlink sounding, respectively~~ NDPA sounding with SI2SR NDP or SR2SI NDP or both SI2SR NDP and SR2SI NDP (see 11.21.18.7 (Non-TB sensing measurement instance)). These figures are examples of basic procedures and are not meant to be exhaustive of all possible uses of the protocol.

## *TGbf Editor: Please replace Figure 6-28a with the following:*



Figure 6-28a – WLAN sensing procedure~~,~~ with a TB sensing measurement instance (#819, #828, #211, #371, #731, #822, #389, #824, #829)

## *TGbf Editor: Please add the following text after Figure 6-28a.*

In Figure 6-28a (WLAN sensing procedure with a TB sensing measurement instance) and Figure 6-28b (WLAN sensing procedure with a non-TB sensing measurement instance), the arc that connects a primitive with a frame at MLME indicates that this primitive initiates the transmission of the connected frame and contains all the parameters needed to configure the frame, and the arc that connects frames at MLME indicates that the preceding frame initiates the transmission of the subsequent frame and contains all the parameters needed to configure the subsequent frame. (#484)

## *TGbf Editor: Please replace Figure 6-28b-d with the new figure below.*



Figure 6-28b –WLAN sensing procedure~~,~~ with a non-TB sensing measurement instance (#819, #828, #389, #825, #212, #371, #731, #35, #822, #826, #827, #828)

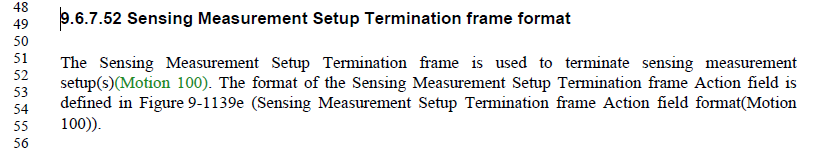
## *TGbf Editor: Please add the following text after Figure 6-28b.*

In Figure 6-28b (WLAN sensing procedure with a non-TB sensing measurement instance), the Sensing NDPA frame shall configure the SR2SI NDP that is sent by the sensing responder after receiving the Sensing NDPA frame and subsequent SI2SR NDP. (#484)

In Figure 6-28b (WLAN sensing procedure with a non-TB sensing measurement instance), if the sensing responder is assigned the role of sensing receiver only, the SI2SR NDP is used to obtain sensing measurements. In this case, the SR2SI NDP that is sent by the sensing responder in response to the received Sensing NDPA frame and subsequent SI2SR NDP is not shown in the figure (see 11.21.18.7 (Non-TB sensing measurement instance)). If the sensing responder is assigned the role of sensing transmitter only, the SR2SI NDP is used to obtain sensing measurements. In this case, the SI2SR NDP that is sent following the Sensing NDPA frame is not shown in the figure (see 11.21.18.7 (Non-TB sensing measurement instance)). If the sensing responder is assigned the roles of sensing transmitter and sensing receiver, both SI2SR NDP and SR2SI NDP are used to obtain sensing measurements. (#822)

# 9.6.7.52 Sensing Measurement Setup Termination frame format

## *TGbf Editor: Please modify the text at L51P70 in subclause 9.6.7.52 in Draft 0.2 as follows.*

****The Sensing Measurement Setup Termination frame is an Action or an Action No Ack frame of category Public used to terminate sensing measurement setup(s) (Motion 100) (#35).

**SP**

Do you support the proposed modifications to the following CIDs and incorporate the changes into the latest TGbf draft: CID 212, 213, 214, 371, 824, 731, 35, 388, 733, 468, 469, 658, 659, 826, 827, 829, 820, 822, 389, 825, 732, 821, 484

Y/N/A