IEEE P802.11
Wireless LANs

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| Initial Sponsor ballot - some proposed resolutions for comments assigned to the author (Peter Ecclesine) |
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|  |  |  |  |  |

Abstract

This document contains proposed resolutions to SB0 comments assigned to the author.

R0: CIDs 5314, 5535, 5556, 5589 (MAC); 5971, 5973 (GEN); 6319 (EDITOR). The proposed resolution to CID 5971 is incomplete, and will be completed in a subsequent revision.

R1: Moved approved CIDs to end. Added proposed resolutions to SB0 comments 5969, 5970 and 5972 (MAC).

R2: Revision based on comments September13th, adding dot11GuidanceActivated and an extended capabilities indication.

R3: Revision based on offline discussion after posting R2, adding text Guiding STAs about the likely future channel should the DFS owner leave this channel. The proposed resolution to CID 5971 is complete.

R4: CID 5971 discussed November 11, 2015 and ready for motion. For CIDs 5969, 5970 and 5972, to dot11GuidanceActivated, add “A Channel Switch Announcement element with a Channel Switch Mode value of 2 shall not be in frames sent to the broadcast address and shall not be in unicast frames addressed at a STA that does not indicate the dot11GuidanceActivated capability.”

R5: Use new element for DFS Guidance rather than use Channel Switch Mode.

R6: Revised based on January 20, 2016 discussion, removing use of Ethertype 89-0d.

R7: Revised based on offline discussion after posting R6, changing procedure name to DFS Guidance operation.

# Comments owned by MAC

| **CID** | **Page** | **Clause** | **Resn Status** | **Comment** | **Proposed Change** | **Resolution** | **Owning Ad-hoc** |
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| 5969 | 730.57 | 8.4.2.18 |  | In some DFS bands it is important to close the channel as quickly as possible, and one means is to indicate well ahead of time the future preferred channel, so STAs know which channel the Master intends to migrate the BSS. The Channel Switch Mode field should also have a value to indicate a future preferred channel switch target channel so if the AP or DFS owner ceases transmission on this channel, the other STAs know where to scan next for the beaconing STA. | For Channel Switch, Extended Channel Switch and Mesh Channel Switch, define a Channel Switch Mode or Reason Code to indicate this is not an active channel switch, but indicated the future preferred channel to be scanned if STAs leave this channel. Define a specific value of Channel Switch Count that is used when the element indicates the future preferred channel. |  | MAC |

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| 5970 | 876.42 | 8.4.2.52 |  | In some DFS bands it is important to close the channel as quickly as possible, and one means is to indicate well ahead of time the future preferred channel, so STAs know which channel the Master intends to migrate the BSS. The Channel Switch Mode field should also have a value to indicate a future preferred channel switch target channel so if the AP or DFS owner ceases transmission on this channel, the other STAs know where to scan next for the beaconing STA. | For Channel Switch, Extended Channel Switch and Mesh Channel Switch, define a Channel Switch Mode or Reason Code to indicate this is not an active channel switch, but indicated the future preferred channel to be scanned if STAs leave this channel. Define a specific value of Channel Switch Count that is used when the element indicates the future preferred channel. |  | MAC |

**Discussion**

SB0 CIDs 5969 on Channel Switch Announcement element and 5970 on Extended Channel Switch Announcement element apply to text defining values for guidance about the next likely channel that a beaconing station will use if it ceases transmission on this channel in a restricted band e.g., the 5 GHz radar bands, the US 3650 MHz band and the TV white space bands. For background on restricted bands and client restrictions, see <https://mentor.ieee.org/802.11/dcn/12/11-12-1159-03-00ai-masers-slaves-and-clients.pptx> . In some restricted bands, an unassociated STA can only transmit to achieve association, so it passively scans, choses a STA to associate to, then authenticates and associates. From the moment of first transmission, it operates under the control of the STA it is transmitting to.

**Proposed Resolution**

Revised. Make changes under CIDs 5969 and 5970 in <this-document>.

Editing instructions are based on REVmc Draft 5.0.

ANA Resources required: Extended Capabilities bit for DFS Guidance, Public Action Frame for DFS Guidance, dot11StationConfigEntry for dot11DFSGuidanceActivated.

*At [5.0]668.60 Table 9-47 Category values, insert new category action as follows:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Code | Meaning | See subclause | Robust | Group addressed privacy |
| <ANA> | DFS Guidance | 11.9.10 | No | No |

*At [5.0]743.46 Channel Switch Announcement element, change as shown*: “A~~n AP or an IBSS~~ STA sets the Channel Switch Mode field to ~~either~~ 0, 1 or 2~~1~~ on transmission.”

*At [5.0]744.02 Channel Switch Announcement element, insert new text at the end of the sixth para as follows:*

When the Channel Switch Mode value is 2, the Channel Switch Count field is reserved.

*At [5.0]843.36 Table 9-134 Extended Capabilities field, insert new extended capability field as shown:*

|  |  |  |
| --- | --- | --- |
|  Bit | Information  | Notes |
| <ANA> | DFS Guidance | The STA sets the DFS Guidance field to 1 when dot11DFSGuidanceActivated is true and sets it to 0 otherwise. See 11.9.10 DFS Guidance operation. |

*At [5.0]1132.37 Table 9-302 Public Action field values, insert new Public Action field and change the Reserved field value accordingly:*

|  |  |
| --- | --- |
| Public Action field value | Description |
| <ANA> | DFS Guidance |
| 3~~2~~5—255 | Reserved |

*At [5.0]1249.34 in 9.6 Action Frame format details, insert text as follows:*

9.6.24 DFS Guidance Action field format

The DFS Guidance Action frame uses the Action frame body format and is transmitted to guide STAs about the likely future channel if the sending STA change channels of operation. The format of the DFS Guidance Action field is shown in Figure 9-736a (DFS Guidance frame Action field format).

|  |  |
| --- | --- |
| Category | Channel Switch Announcement frame Action field |

Octets 1 variable

**Figure 9-736a—DFS Guidance frame Action field format**

The Category field is defined in 9.4.1.11 (Action field).

The Channel Switch Announcement frame Action field is defined in 9.6.2.6 (Channel Switch Announcement frame format).

The DFS Guidance procedure is defined in 11.9.10 (DFS Guidance operation).

*At [5.0]1668.55 in 11.9.1 DFS procedures, General, change text as shown:*

A STA shall use the DFS procedures defined in 11.9.1 (General) to 11.9.10 (DFS Guidance operation) ~~11.9.9 (Channel Switch Announcement element operation)~~ if dot11SpectrumManagementRequired is true.

A STA shall use the DFS procedures defined in 11.9.10 (DFS Guidance operation) if dot11SpectrumManagementRequired and dot11DFSGuidanceActivated are true.

*At [5.0]1669.14 11.9.1 DFS procedures, General, insert new text as follows:*

* Guiding STAs about the likely future channel should the AP leave this channel (see 11.9.10 (DFS Guidance operation))

*At [5.0]1674.13, Selecting and advertising a new channel in a non-DMG infrastructure BSS third para, change text as shown:* “element to 1. When dot11DFSGuidanceActivated is true, a STA may guide STAs that the channel switch target is in the future by

– setting the Channel Switch Mode field in the Channel Switch Announcement element to 2,

– including a likely future channel number in the New Channel Number field and

– setting the Channel Switch Count field to 255.

A Channel Switch Announcement element with a Channel Switch Mode value of 2 shall not be in unicast frames addressed to a STA that does not indicate the dot11DFSGuidanceActivated capability. The likely future channel might change before a channel switch announcement with a mode value of 0 or 1 is sent on a channel. Once a channel switch announcement with a mode value of 0 or 1 is sent on a channel, channel switch announcements with a mode value of 2 shall not be sent on that channel until after the channel switch is completed.”

*At [5.0]1675.41, Selecting and advertising a new channel in an IBSS eighth paragraph, change text as shown:* “no suitable channel. When dot11DFSGuidanceActivated is true, a STA may guide STAs that the channel switch target is in the future by

– setting the Channel Switch Mode field in the Channel Switch Announcement element to 2,

– including a likely future channel number in the New Channel Number field and

– setting the Channel Switch Count field to 255.

A Channel Switch Announcement element with a Channel Switch Mode value of 2 shall not be in unicast frames addressed to a STA that does not indicate the dot11DFSGuidanceActivated capability. The likely future channel might change before a channel switch announcement with a mode value of 0 or 1 is sent on a channel. Once a channel switch announcement with a mode value of 0 or 1 is sent on a channel, channel switch announcements with a mode value of 2 shall not be sent on that channel until after the channel switch is completed.”

*At [5.0]1679.37, before 11.10 Extended channel switching, insert text as follows:*

11.9.10 DFS Guidance operation

This subclause defines a mechanism to create, communicate and act on the DFS Guidance Public Action frame.

When dot11DFSGuidanceActivated is true, a STA shall follow these procedures for DFS Guidance operation.

The DFS Guidance frame is transmitted from the beaconing STA to other STAs using a Public Action frame.

The DFS Guidance Action Frame field shall be set to the contents of the Channel Switch Announcement Action frame, from the Category field to the end of the Action frame body.

When dot11DFSGuidanceActivated is true, a STA guides other STAs that the channel switch target is in the future by

– setting the Channel Switch Mode field in the Channel Switch Announcement element to 2,

– including a likely future channel number in the New Channel Number field and

– setting the Channel Switch Count field to 255.

A non-AP STA in an infrastructure BSS shall not transmit the DFS Guidance Public Action frame. A non-beaconing STA in an IBSS shall not transmit the DFS Guidance Public Action frame.

A STA receiving the DFS Guidance Public Action frame shall retain the information until it receives another DFS Guidance Public Action frame from the same STA, it receives a Channel Switch Announcement element with a Channel Switch Mode field value that is not 2 from the same STA, or it chooses to not operate under the control of the sending STA.

*At [5.0]2764.27 Table B.4.10 Spectrum management extensions, insert text as follows:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | IUT configuration | References | Status | Support |
| SM20.10 | Transmission of DFS Guidance Action procedure by a STA | 11.9.10 (DFS Guidance operation) | CFSM:O | Yes  No  N/A  |
| SM20.11 | Reception of DFS Guidance Action procedure by a STA | 11.9.10 (DFS Guidance operation) | CFSM:O | Yes  No  N/A  |

*At [5.0]2881.59 in Dot11StationConfigEntry, insert text as follows:*

dot11DFSGuidanceActivated TruthValue

*At [5.0]2902.56 at the correct place in the dot11StationConfigEntry table, insert text as follows:*

dot11DFSGuidanceActivated OBJECT-TYPE

 SYNTAX TruthValue

 MAX-ACCESS read-write

 STATUS current

 DESCRIPTION

 "This is a control variable.

 It is written by an external management entity or the SME. Changes

 take effect as soon as practical in the implementation.

 This attribute, when true, indicates the capability of the STA to support

 DFS guidance procedures is enabled. The capability is disabled otherwise."

 DEFVAL {false}

 ::= { dot11StationConfigEntry <ANA> }

*At [5.0]3361.10 in dot11SMTbase13 after the last named object, change text to add dot11DFSGuidanceActivated as shown:*

dot11BeaconRssiTable,

 dot11DFSGuidanceActivated

}

| **CID** | **Page** | **Clause** | **Resn Status** | **Comment** | **Proposed Change** | **Resolution** | **Owning Ad-hoc** |
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| 5972 | 975.47 | 8.4.2.102 |  | In some DFS bands it is important to close the channel as quickly as possible, and one means is to indicate well ahead of time the future preferred channel, so STAs know which channel the Master intends to migrate the BSS. The Channel Switch Mode field should also have a value to indicate a future preferred channel switch target channel so if the AP or DFS owner ceases transmission on this channel, the other STAs know where to scan next for the beaconing STA. | For Channel Switch, Extended Channel Switch and Mesh Channel Switch, define a Channel Switch Mode or Reason Code to indicate this is not an active channel switch, but indicated the future preferred channel to be scanned if STAs leave this channel. Define a specific value of Channel Switch Count that is used when the element indicates the future preferred channel. |  | MAC |

**Discussion**

CID 5972 on Mesh Channel Switch Parameters element apply to text defining values for channel switch mode.

In an MBSS the Channel Switch Mode field is reserved, consequently new text for giving DFS guidance is required. Refer to the description above on CIDs 5969 and 5970 for more background of related changes.

**Proposed Resolution**

Revised. Make changes under CID 5972 in <this-document>.

*At [5.0]743.47 9.4.2.19 Channel Switch Announcement element, change text as shown:* “~~In an MBSS, the Channel Switch Mode field is reserved.~~

*At [5.0]888.45 9.4.2.53 Extended Channel Switch Announcement element, change text as shown:* “~~The Channel Switch Mode field is reserved in an MBSS.~~

*At [5.0]1676.64, Initiating MBSS channel switch third paragraph, change text as shown:* “~~The Channel Switch Mode field is reserved.~~

When dot11DFSGuidanceActivated is true, a mesh STA may guide peer mesh STAs that the channel switch target is in the future by

– setting the Channel Switch Mode field in the Channel Switch Announcement element to 2,

– including a likely future channel number in the New Channel Number field and

– setting the Channel Switch Count field to 255.

A Channel Switch Announcement element with a Channel Switch Mode value of 2 shall not be in unicast frames addressed to a STA that does not indicate the dot11DFSGuidanceActivated capability. The likely future channel might change before a channel switch announcement with a mode value of 0 or 1 is sent on a channel. Once a channel switch announcement with a mode value of 0 or 1 is sent on a channel, channel switch announcements with a mode value of 2 shall not be sent on that channel until after the channel switch is completed.”

# Comments owned by GEN

| **CID** | **Page** | **Clause** | **Resn Status** | **Comment** | **Proposed Change** | **Resolution** | **Owning Ad-hoc** |
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| 5971 | 3337.63 | E.1 |  | It is hard to manage a mixed BSS where some STAs only understand a regional Operating Class table, and others understand the Global Operating Class Table. It is difficult to signal measurement requests and responses for operating classes in more than one table. Add an explicit requirement that multi-domain capable STAs support Table E-4 Global Operating Classes going forward, and that use of non-Global Operating Classes may be deprecated in future revisions of the standard. | Add an explicit requirement that multi-domain capable STAs support Table E-4 Global Operating Classes going forward, and that use of non-Global Operating Classes may be deprecated in future revisions of the standard. |  | GEN |

**Discussion**

As the comment indicates, in countries that have non-global operating classes, management information has to be sent with one country element to STAs that do not support the Global operating classes, and with another country element to STAs that support the relevant global operating classes. Rather than create a new requirement, we can encourage use of Global Operating Classes by requiring STAs that support them to signal that support by reporting in their Country String the global operating classes table. We propose to insert a new 9.21.3a Operation with multiple country elements after 9.21.3 “**Operation with operating classes and the Transmit Power Envelope element**”, which specifies some transmit power requirements.

**Proposed Resolution**

Revised. Make changes under CID 5971 in <this-document>.

*At 1320.50 insert:* **9.21.3a** **Operation with multiple country elements**

When communicating with a STA that supports global operating classes, all requests and Action frames that convey elements containing operating classes shall use global operating class values.

When dot11OperatingClassesImplemented is true, the following statements apply:

— When dot11OperatingClassesRequired is false, or where operating classes domain information is not present in a STA, that STA is not required to change its operation in response to an element or element-specific Information field that contains an operating class.

— When dot11OperatingClassesRequired is true and the STA supports one one more global operating classes, or where global operating classes domain information is present in a STA, the STA shall indicate current operating class information in the Country element and Supported Operating Classes element using the country string for the global operating classes, except that a VHT STA may omit from the Country element any Operating Triplet field for an Operating Class for which the Channel spacing (MHz) column indicates 80 MHz or wider and for which the Behavior limits set column in the applicable table in Annex E contains only a blank entry or either or both of “80+” and “UseEirpForVHTTxPowEnv.”

*At 2730.54, insert a new row in the Operating Classes (removing the tabs that represent columns) as follows:* “OC8 Operation with multiple country elements 9.21.3a OC1:O Yes  No  N/A 

# Comments owned by MAC

| **CID** | **Page** | **Clause** | **Resn Status** | **Comment** | **Proposed Change** | **Resolution** | **Owning Ad-hoc** |
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| 5314 | 740.51 | 8.4.2.20.7 |  | The sentence that begins "For operating classes that encompass a primary channel but do not identify the location of the primary channel," confuses operating classes with the field named "Operating Class". | Replace the full sentence that begins "For operating classes that encompass ..".with: "A request frame is a request to make iterative measurements for all primary channel positions in all channels listed in the frame's AP Channel Report subelement when all of the following pertain:" -- The operating class indicated by the value of the Operating Class field in that frame encompasses a primary channel." -- The frame does not identify the location of that primary channel." -- The value of the frame's Channel Number field is 255." -- The channel is supported." -- The measurement is permitted on the channel." -- The channel is permitted in the current regulatory domain." |  | MAC |

**Discussion**

The proposed change text corrects the description of iterative measurements on all primary channel positions listed in the frame’s AP Channel Report subelement. The sentence being revised has 66 words and several qualifying phrases, and is much clearer when expressed as a dashed list.

**Proposed Resolution**

Accepted. Make changes proposed in CID 5314.

| **CID** | **Page** | **Clause** | **Resn Status** | **Comment** | **Proposed Change** | **Resolution** | **Owning Ad-hoc** |
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| 5535 | 1637.19 | 10.8.3 |  | A comparison with the fourth paragraph of 10.8.2 leads to the question: why is there no specification of the use of Country, Power Constraint and VHT Transmit Power Envelope elements, as well as Maximum Transmit Power Level field, etc. with respect to mesh STAs? Are mesh STAs not subject to power contraint regulations? Or are mesh STAs not allowed to use 11ac facilities? | Insert a new paragraph specifying the use of power constraint facilities to accommodate regulations. |  | MAC |

**Discussion**

As 10.8.2 only discusses requirements for association, and 10.8.3 discusses requirements for peering, it is appropriate to add transmit power constraints to 10.8.3.

**Proposed Resolution**

Revised. Make changes under CID 5535 in <this-document>.

At 1637.19 (at the end of 10.8.3 after the para) add:

“If a STA sends a Country element, a Power Constraint element, and a Transmit Power Envelope element,

where the interpretation of the Maximum Transmit Power Level field in the Country element for a 20 MHz

or 40 MHz Subband Triplet field is the same as the Local Maximum Transmit Power Unit Interpretation

subfield, then at least one of local power constraints indicated by the Local Maximum Transmit Power For

20 MHz and Local Maximum Transmit Power For 40 MHz fields in the Transmit Power Envelope element

shall be the same as the indicated local power constraint expressed by the combination of Country element

and Power Constraint element.”

| **CID** | **Page** | **Clause** | **Resn Status** | **Comment** | **Proposed Change** | **Resolution** | **Owning Ad-hoc** |
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| 5556 | 1640.04 | 10.9.1 |  | "Detecting radar in the current and other channels based on regulatory requirements": "based on" appears to modify "channels", when it actually modifies "detecting" | Replace "channels based" with "channels, based". |  | MAC |

**Discussion**

The comma insertion clarifies the phrase.

**Proposed Resolution**

Accepted. Make the change proposed in CID 5556.

| **CID** | **Page** | **Clause** | **Resn Status** | **Comment** | **Proposed Change** | **Resolution** | **Owning Ad-hoc** |
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| 5589 | 1646.17 | 10.9.8.3 |  | "within a spectrum-managed IBSS": but there is no definition of "spectrum-managed" anythng in this standard. | Replace "within a spectrum-managed IBSS" with "in an IBSS". |  | MAC |

**Discussion**

Clause 10.9.8.3 **Selecting and advertising a new channel in an IBSS** describes one of the DFS procedures, which are defined for spectrum managed bands (PICS CF10). The proposed change removes a redundant qualification from the phrase.

**Proposed Resolution**

Accepted. Make the change proposed in CID 5589.

# Comments owned by GEN

| **CID** | **Page** | **Clause** | **Resn Status** | **Comment** | **Proposed Change** | **Resolution** | **Owning Ad-hoc** |
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| 5973 | 3343.01 | E.1 |  | Close to half of the Japan table entries duplicate other entries as a legacy from 802.11j. We should indicate they are deprecated and may be reserved in a future version of the standard. | Add a note saying we are deprecating use of classes 3, 4, 5, 6, 8, 9, 10, 11, 13, 14, 15, 17, 18, 19, 20, 22, 23, 24, 26, 27, 28, 29, 33, 35, 38, 40, 43, 45, 47, 48, 49, 50, 52, 53, 54, 55 and they may be reserved in a future version of the standard. |  | GEN |

**Discussion**

As the comment indicates, the removal of class distinctions based on transmit mask and interference class, introduced by 802.11-2012, resulted in many Japanese operating classes that have not been implemented in a real-world product. I do not know of any products for Behavior Limits set “licensed base STA” or Emissions Limit set “other interference areas.” I do know of “mobile STAs” and “nomadic use” in “interference limited areas.” We adopt the same convention as the PICS and use an asterisk after each obsolete class and precede Table E-2 with explanatory text

**Proposed Resolution**

Revised. Make changes under CID 5973 in <this-document>.

At 3343.01 (after sentence) add: “Note that some of the operating classes in this table were never used and are obsolete. The obsolete operating classes indicated by an asterisk (\*) might be removed in a future revision of the standard.”

At 3343.21 in the “Operating class” column an asterisk after classes as shown: 2\*, 4\*, 5\*, 7\*, 9\*, 10\*, 12\*, 14\*, 15\*, 16\*, 18\*, 19\*, 21\*, 23\*, 24\*, 27\*, 28\*, 35\*, 38\*, 40\*, 43\*, 45\*,

47\*, 48\*, 49\*, 50\*, 52\*, 53\*, 54\* and 55\*.

# Comments owned by EDITOR

| **CID** | **Page** | **Clause** | **Resn Status** | **Comment** | **Proposed Change** | **Resolution** | **Owning Ad-hoc** |
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| 6319 |  |  |  | The behavior limits sets identified in Annex E are no longer so identified by number, just by name, so using the numbers elsewhere is just needlessly confusing | Change from numbers to words on p. 666 (4x), 890 (2x), 891 (4x), 1649 (2x), 1694 (4x), 3352. Delete the Encoding column in Table D-2 |  | EDITOR |

**Discussion**

As the comment indicates, the standard uses names for behaviour limits in Annex E.

**Proposed Resolution**

Revised. Make changes under CID 6319 in <this-document>.

At 666.37, replace “class that includes a value of 13 or 14 in the behavior limits as specified in Annex E,” with “class that includes a value of PrimaryChannelLowerBehavior or PrimaryChannelUpperBehavior in the behavior limits as specified in Annex E,”.

At 666.40, replace “does not include a value of 13 or 14” with “does not include a value of PrimaryChannelLowerBehavior or PrimaryChannelUpperBehavior”.

At 890.13, replace “a value of 13 or 14” with “a value of PrimaryChannelLowerBehavior or PrimaryChannelUpperBehavior”.

At 891.09, 891.15, 891.19 and replace “value 16:” with “value DFS\_50\_100\_Behavior:”.

At 1649.17, replace “**behavior limits set of 16**” with “**behavior limits set of DFS\_50\_100\_Behavior**”.

At 1649.21, replace “includes the value 16;” with “includes the value DFS\_50\_100\_Behavior;”.

At 1694.18, replace “if the Behavior Limit parameter of the selected row contains the value 13” with “if the Behavior Limit parameter of the selected row contains the value PrimaryChannelLowerBehavior”

At 1694.21, replace “selected row contains the value 14” with “selected row contains the value PrimaryChannelUpperBehavior”.

At 1694.24, replace “selected row contains neither the value 13 nor the value 14” with “selected row contains neither the value PrimaryChannelLowerBehavior nor the value PrimaryChannelUpperBehavior”.

At 3331.07, delete the “Encoding” column from Table D-2.

At 3352.43 , replace “STAs operating under the behavior limits set 17” with “STAs operating with a behavior limits set value of ITS\_nonmobile\_operations”.