**3GPP TSG-RAN WG4 Meeting # 99-e R4-210XXXX**

**Electronic Meeting, 19th – 27th May 2021**

**Agenda item:** 5.1.5 5.1.6 5.1.7.4 5.2.2

**Source:** Moderator (China Telecom)

**Title:** Email discussion summary for [99-e][320] Demod\_R16\_Maintenance\_Part2

**Document for:** Information

# Introduction

This email thread discusses the Rel-16 maintenance for NR\_DL256QAM\_FR2, NR\_perf\_enh-Perf and other NR and LTE performance.

List of candidate target of email discussion for 1st round and 2nd round:

* 1st round: Invite companies to review and give comments to the open issue and the Cat. F CRs.
* 2nd round: TBA

# Topic #1: Maintainess for NR DL 256QAM for FR2

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2109139 | China Telecom | CR on finalization on the FR2 256QAM CQI report test case (Cat F CR for Rel-17) |
| R4-2109189 | Intel Corporation | Proposal 1: Clarify assumption on initial phase matrix of LOS component for TDL-D channel model definition in TS 38.101-4: [1 j; 1 -j] or [1 1; 1 -1]. |
| R4-2109764 | ZTE Corporation | CR for 38.101-4 Rel-17 correction on demodulation performance requirements for FR2 DL 256QAM (Cat F CR for Rel-17) |
| R4-2110556 | Huawei, HiSilicon | CR on SDR requirements for DL 256QAM for FR2 (Rel-15) |
| R4-2110557 | Huawei, HiSilicon | CR on correction of FRC for DL 256QAM (Rel-16) |
| R4-2110558 | Huawei, HiSilicon | Reserved.  CR on correction of FRC for DL 256QAM (Rel-17) |
| R4-2110559 | Huawei, HiSilicon | CR on correction of FR2 256QAM CQI applicability rules (Rel-16) |
| R4-2110560 | Huawei, HiSilicon | Reserved.  CR on correction of FR2 256QAM CQI applicability rules (Rel-17) |
| R4-2110636 | Ericsson | CR: Update of TDLD30 delay profile (Cat F CR for Rel-17) |
| R4-2110777 | Ericsson | Observation: It is observed the significant performance difference depending on the selected channel matrix for LOS path in TDLD30-75.  Proposal: TS38.101-4 should specify the channel matrix for LOS path in TDLD30, e.g., H = [1 j; 1 -j]. |
| R4-2110778 | Ericsson | Reserved.  CR: Update of TDLD30 delay profile (Cat A CR for Rel-16) |
| R4-2111206 | Intel Corporation | CR on clarification of TDL-D channel model (Cat F CR for Rel-16) |
| R4-2111207 | Intel Corporation | Reserved.  CR on clarification of TDL-D channel model (Cat A CR for Rel-17) |
| R4-2111290 | Qualcomm Incorporated | CR on FRC Correction for FR2 DL 256QAM Requirements (Cat F CR for Rel-16) |
| R4-2111291 | Qualcomm Incorporated | Reserved.  CR on FRC Correction for FR2 DL 256QAM Requirements (Cat A CR for Rel-17) |

## Open issues summary

### Sub-topic 1-1 TDLD channel modeling

Issue 1-1: LOS component for TDL-D channel model definition in TS 38.101-4

* Proposals
  + Option 1: Initial phase matrix of LOS component [1 j; 1 -j] or [1 1; 1 -1] (Intel)
  + Option 2: Specify the channel matrix for LOS path in TDLD30, e.g., H = [1 j; 1 -j] (Ericsson)
* Recommendation for the first round
  + Based on companies’ proposal, encourage companies to check whether it is reasonable to specify H = [1 j; 1 -j] for the LOS component for TDLD30 channel model.
  + Check whether the related changes in R4-2110636 **and/or** R4-2111206 can be agreeable.

## Companies views’ collection for 1st round

### Open issues

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| **Company** | **Comments** |
| XXX | Issue 1-1: LOS component for TDL-D channel model definition in TS 38.101-4  Others: |
| Ericsson | Issue 1-1: LOS component for TDL-D channel model definition in TS 38.101-4  We support moderator’s proposal - Specify H = [1 j; 1 -j] for the LOS component for TDLD30 channel model.  Regarding the CR, our CR forget to update Table B.2.2-2 to add TDLD35-75. We are ok to use R4-2111206 (Intel). |

### CRs/TPs comments collection

*For close-to-finalize WIs and maintenance work, comments collections can be arranged for TPs and CRs. For ongoing WIs, suggest to focus on open issues discussion on 1st round.*

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| **CR/TP number** | **Comment collection** |
| R4-2109139, CTC, finalization on the FR2 256QAM CQI report test case | Moderator’s comment: 1) Should be Cat F CR for Rel-16. 2) Tdoc number for the Cat A CR was not reserved.  Solutions if the content can be agreed in the first round: 1) This CR will be revised from Rel-17 Cat.F to Rel-17 Cat.A with CR revision+1; 2) Tdoc number for the Rel-16 Cat.F CR will be reserved after the first round discussion. |
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| R4-2109764, ZTE, correction on demodulation performance requirements | Moderator’s comment: 1) Should be Cat F CR for Rel-16. 2) Tdoc number for the Cat A CR was not reserved. 3) Changes on removing [] overlaps with HW R4-2110557.  Solutions if the content can be agreed in the first round: 1) This CR will be revised from Rel-17 Cat.F to Rel-17 Cat.A with CR revision+1; 2) Tdoc number for the Rel-16 Cat.F CR will be reserved after the first round discussion. |
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| R4-2110556. HW, CR on R15 SDR requirements | Ericsson: Change is ok. It is better to clarify in the coversheet no Cat-A CRs are needed for Rel-16/17, to avoid confusion. |
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| R4-2110557, HW, CR on correction of FRC for DL 256QAM (Rel-16) | Moderator’s comment: 1) Changes on removing [] overlaps with ZTE R4-2109764. 2) Changes on correcting FRC table number overlaps with QC R4-2111290. |
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| R4-2110559, HW, CR on correction of FR2 256QAM CQI applicability rules (Rel-16) |  |
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| R4-2110636, E///, CR: Update of TDLD30 delay profile | Ericsson: Depends on the conclusion of Issue 1-1. We propose to merge this CR to R4-2111206. |
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| R4-2111206, Intel, CR on clarification of TDL-D channel model (R16) | Ericsson: Depends on the conclusion of Issue 1-1. We are ok with this CR. |
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| R4-2111290, QC, CR on FRC Correction for FR2 DL 256QAM Requirements | Moderator’s comment: Changes on correcting FRC table number overlaps with HW R4-2110557. |
| Ericsson: Propose to merge to R4-21010558. |
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## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

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|  | **Status summary** |
| **Sub-topic #1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

*Note: The tdoc decisions shall be provided in Section 3 and this table is optional in case moderators would like to provide additional information.*

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| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

# Topic #2: Maintainess for Rel-16 NR Performance Requirement Enhancement

## Companies’ contributions summary

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| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2109812 | Samsung | CR: Correction on PMI test cases with Rel-15 Type I, TypeII codebook (Cat F R16) |
| R4-2109813 | Samsung | Reserved.  CR: Correction on PMI test cases with Rel-15 Type I, TypeII codebook (Cat A R17) |
| R4-2110590 | Nokia, Nokia Shanghai Bell | CR for 38.141-2: Demodulation performance enhancement specification maintenance (Cat F R16) |
| R4-2110591 | Nokia, Nokia Shanghai Bell | Reserved.  CR for 38.141-2: Demodulation performance enhancement specification maintenance (Cat A R17) |
| R4-2110633 | Ericsson | CR: Correction of the applicability of requirements (Cat F R16) |
| R4-2110785 | Ericsson | Reserved.  CR: Correction of the applicability of requirements (Cat A R17) |
| R4-2111172 | Qualcomm Incorporated | CR on Applicability Rule for TDD LTE-NR Coexistence Tests (Cat F R16) |
| R4-2111212 | Qualcomm Incorporated | Reserved.  CR on Applicability Rule for TDD LTE-NR Coexistence Tests (Cat A R17) |

## Open issues summary

*No open issue spotted.*

## Companies views’ collection for 1st round

### CRs/TPs comments collection

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| **CR/TP number** | **Comment collection** |
| R4-2109812, Samsung, Correction on PMI test cases with Rel-15 Type I, Type II codebook | Moderator’s comment: There remains change track on the coversheet. |
| Apple: Ok with updates |
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| R4-2110590, Nokia, CR for 38.141-2: Demodulation performance enhancement specification maintenance |  |
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| R4-2110633, E///, CR: Correction of the applicability of requirements | Apple: OK with updates. |
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| R4-2111172, QC, CR on Applicability Rule for TDD LTE-NR Coexistence Tests | Apple: OK with updates. |
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## Summary for 1st round

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

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| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

# Topic #3: Maintainess for Other Rel-16 NR Performence Requirements

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2109106 | CATT | Summary of ideal and impairment results for NR HST BS demodulation requirements |
| R4-2109107 | CATT | CR for TS 38.141-2: Introduction of NR PUSCH UL TA performance requirement (Rel-16) |
| R4-2109108 | CATT | Reserved.  CR for TS 38.141-2: Introduction of NR PUSCH UL TA performance requirement (Rel-17) |
| R4-2109205 | Intel Corporation | CR to TS 38.101-4: HST-DPS channel model clarification (R16) |
| R4-2109206 | Intel Corporation | Reserved.  CR to TS 38.101-4: HST-DPS channel model clarification (R17) |
| R4-2109348 | Apple | Observation #1: To support the current configuration of simultaneously tracking 2 TRS resource sets in the same slot, the UE should also indicate capability for maxSimultaneousResourceSetsPerCC >1.  Observation #2: To complete test applicability for HST-DPS, one of the updates are required:  Option 1: HST-DPS test cases with 2 active TCI states are only applicable to UE that support maxSimultaneousResourceSetsPerCC >1.  Option 2: TRS resource set configurations are updated to have different slot offsets.  Proposal #1: Update the TRS resource set configurations to have different slot offsets – [1,2] and [5,6]. |
| R4-2109349 | Apple | CR to 38.101-4 on TRS config update for HST-DPS test cases- R16 |
| R4-2109350 | Apple | Reserved.  CR to 38.101-4 on TRS config update for HST-DPS test cases- R17 |
| R4-2109521 | CMCC | CR on HST-SFN requirements for TDD |
| R4-2109522 | CMCC | Available.  CR on HST-SFN requirements for TDD (Cat. A) |
| R4-2109600 | Ericsson | CR for TS38.141-2 remove SNR brackets for HST PUSCH demodulation (catF) |
| R4-2109601 | Ericsson | Reserved.  CR for TS38.141-2 remove SNR brackets for HST PUSCH demodulation (catA) |
| R4-2109708 | NTT DOCOMO, INC. | CR for TS 38.141-1 Updates of NR PUSCH performance requirements for HST |
| R4-2109709 | NTT DOCOMO, INC. | Reserved.  CR for TS 38.141-1 Updates of NR PUSCH performance requirements for HST |
| R4-2109801 | Samsung | CR on correction of UL timing adjustment conducted performance requirement for TS 38.141-1 |
| R4-2109802 | Samsung | Reserved.  CR on correction of UL timing adjustment conducted performance requirement for TS 38.141-1 |
| R4-2110552 | Huawei, HiSilicon, Ericsson | CR on correction of FRC for HST (Rel-16) |
| R4-2110553 | Huawei, HiSilicon, Ericsson | Reserved.  CR on correction of FRC for HST (Rel-17) |
| R4-2110554 | Huawei, HiSilicon | CR on removal of square brackets for HST requirements (Rel-16) |
| R4-2110555 | Huawei, HiSilicon | Reserved.  CR on removal of square brackets for HST requirements (Rel-17) |
| R4-2110582 | Nokia, Nokia Shanghai Bell | CR for 38.104: HST PUSCH demodulation requirements and spec maintenance |
| R4-2110583 | Nokia, Nokia Shanghai Bell | Reserved.  CR for 38.104: HST PUSCH demodulation requirements and spec maintenance |
| R4-2110584 | Nokia, Nokia Shanghai Bell | CR for 38.141-1: HST demodulation specification maintenance |
| R4-2110585 | Nokia, Nokia Shanghai Bell | Reserved.  CR for 38.141-1: HST demodulation specification maintenance |
| R4-2110586 | Nokia, Nokia Shanghai Bell | CR for 38.141-2: HST demodulation specification maintenance |
| R4-2110587 | Nokia, Nokia Shanghai Bell | Reserved.  CR for 38.141-2: HST demodulation specification maintenance |
| R4-2111472 | Intel Corporation | CR to TS 38.101-4: FRC index update and Editorial corrections (R17) |
| R4-2111473 | Intel Corporation | Reserved.  CR to TS 38.101-4: FRC index update and Editorial corrections (R16) |

## Open issues summary

### Sub-topic 1-1 TRS resource set configuration for HST-DPS test cases

Issue 3-1: TRS resource set configuration for HST-DPS test cases

* Proposals
  + Option 1: Update the TRS resource set configurations to have different slot offsets – [1,2] and [5,6]. (Apple)
* Recommendation for the first round
  + Encourage feedback from more companies and check whether the related changes in R4-2109349 is agreeable.
  + Provide views and comments directly under CR comment collection table for R4-2109349 in 3.3.1.

---------------------GTW------------

QC: Not sure that having different slots for TRS can resolve the problem ? UE still need to have capability to track multiple TCI states.

CMCC: If UE supports 2TCI states, by default UE need to support this multiple resource capability.

Huawei: Besides of number of TCI states, supporting of TRS resources capability also need to be clarified. Another alternative to clarify the UE capability.

E///: We have similar issue on eMIMO demod discussion, same conclusion should be applied for both.

Are you proposing new UE capability signalling?

Huawei: Not new, just include RAN4 test applicable rules with existing capability.

Intel: Not sure we have same understanding on the capability signalling, prefer to apply Huawei proposal with additional capability declaration.

Apple: Maximum number of TRS resources per CC no linkage of number of TCI states, these are different capability.

Agreement:

* Change the test applicable rules of HST-DRS test cases

-UE also required to report supporting maximum number of TRS resources per CC >=2 , then the test cases can be applied for such UE.

- If UE didn’t declare to support either , then DPS 1a can be applied.

- Further work on the text for test applciabel rules into specification.

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## Companies views’ collection for 1st round

### CRs/TPs comments collection

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| **CR/TP number** | **Comment collection** |
| R4-2109107, CATT, CR for TS 38.141-2: Introduction of NR PUSCH UL TA performance requirement (Rel-16) |  |
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| R4-2109205, Intel, CR to TS 38.101-4: HST-DPS channel model clarification | Apple:  In equation (B.3.3.3), why is visibility -Ds to Ds/2 instead of symmetric with -Ds to Ds.  The equation (B.3.3.4) should be applicable for PDCCH as well. |
| Ericsson: We are ok with this clarification. |
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| R4-2109349, Apple, CR to 38.101-4 on TRS config update for HST-DPS test cases- R16 | Moderator’s note for information: Related proposal in R4-2109348 as summarized in Issue 3-1. |
| Apple: As described in our discussion paper, either the applicability rule should be changed for test cases or TRS config updated for tests to be applicable based on UE capability.  If this change is agreed, we would also need to update the FRC tables for correct number of Binary Channel Bits Per Slot in the slots with TRS. |
| Ericsson: We understand the observation. But if UE is capable of monitoring 2 or more active TCI, is it natural for such a UE being capable of maxSimultaneousResourceSetsPerCC >1 also? We need feedback from UE vendors.  If not, it is ok to shift the 2nd TRS to another slot, but it affects to FRC because the current FRC channel bits assume TRS is transmitted with slot offset 1 and 2, as Apple commented avobe. |
| R4-2109521, CMCC, CR on HST-SFN requirements for TDD | Apple: Ok with updates. |
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| R4-2109522, CMCC, CR on HST-SFN requirements for TDD | Apple: Cat A CR is uploaded before Cat F is approved. |
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| R4-2109600, E///, Removing brackets for HST PUSCH in TS38.141-2 |  |
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| R4-2109708, DCM, Updates of NR PUSCH performance requirements for HST |  |
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| R4-2109801, Samsung, CR on correction of UL timing adjustment conducted performance requirement for TS 38.141-1 |  |
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| R4-2110552, HW, CR on correction of FRC for HST (Rel-16) | Apple:  In Table A.3.2.2.2-10, why do we have transmission on S slot for HST-DPS. Shouldn’t it be no PDSCH scheduled in S slot for both HST-SFN and HST-DPS? |
| Ericsson: To Apple, in our understanding, PDSCH is scheduled in special slot, according to WF R4-2017549:   * Scheduling in TDD special slot​   + Scheduled PDSCH in TDD special slots and the special slot configuration as S: 6D 4G 4U as baseline based on the assumption that no obvious performance degradation compared to no slots scheduled in special slot. ​ |
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| R4-2110554, HW, CR on removal of square brackets for HST requirements | Apple: Ok with update. |
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| R4-2110582, Nokia, CR for 38.104: HST PUSCH demodulation requirements and spec maintenance |  |
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| R4-2110584, Nokia, CR for 38.141-1: HST demodulation specification maintenance |  |
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| R4-2110586, Nokia, CR for 38.141-2: HST demodulation specification maintenance |  |
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| R4-2111472, Intel, CR to TS 38.101-4: FRC index update and Editorial corrections (R17) | Apple: This is R17 CR, should it be R4-2111473?  Looks like the entire spec is edited rather than certain sections. Is this right approach for editorial CR? |
| Ericsson: We comment for R4-2111473.  Correction of Table 7.2.2.2.1-3 is overlapped with R4-2110557 (Huawei). |
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## Summary for 1st round

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

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| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

# Topic #4: Maintainess for Other Rel-16 LTE Performence Requirements

*No tdocs submitted.*

# Recommendations for Tdocs

## 1st round

**New tdocs**

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| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| WF on … | YYY |  |
| LS on … | ZZZ | To: RAN\_X; Cc: RAN\_Y |
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**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
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Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics incl. existing and new tdocs.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. For new LS documents, please include information on To/Cc WGs in the comments column
4. Do not include hyper-links in the documents

## 2nd round

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-210xxxx | WF on … | YYY | Agreeable, Revised, Noted |  |
| R4-210xxxx | LS on … | ZZZ | Agreeable, Revised, Noted |  |
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Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. Do not include hyper-links in the documents