**3GPP TSG-RAN WG1 Meeting #115  R1-231xxxx**

**Chicago, USA, 13-17 November, 2023**

**Agenda Item: 8.5.1**

**Source: Moderator (Huawei)**

**Title: FL summary#1 for SD and PD adaptation for R18 NES**

**Document for: Discussion and decision**

# Introduction

This document contains discussion summarized from contributions submitted to RAN1#115 for R18 NES.

The technical issues are listed roughly in the order of issues present from submitted contributions. There is no particular priority among them to be treated or not during this meeting but the discussion flow will generally follow the listed order.

For each issue, TP is also aimed for facilitating the CR/spec work if spec update is deemed necessary. At least the submitted TPs from companies are/will be gathered in the corresponding issue-order in the Appendix-A.

# Online/offline proposals

tbd

# Discussion

1. **CSI reference resource**

The following is recorded as one potential issue for CSI reference resource.

***For RAN1#115:***

*Further discuss in the next meeting for the following case:*

*A UE configured with CSI report configuration with e.g. two sub-configurations (sub-config#1 and sub-config#2), each with e.g. two CSI-RS resources, none of the CSI-RS Tx occasions of sub-config#1 meet the CSI reference resource, i.e. they are later than CSI ref. resource, the UE shall*

* *Alt 1: report the CSI report, according to current spec*
* *Alt 2: report the CSI sub-report#2 only and drop the CSI sub-report#1 only*
* *Alt 3: drop the entire CSI report*

The current specification has the following texts:

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| **5.2.2.5 CSI reference resource definition**  <Text omitted>  After the CSI report (re)configuration, serving cell activation, BWP change, or activation of SP-CSI, the UE reports a CSI report only after receiving at least one CSI-RS transmission occasion for channel measurement and CSI-RS and/or CSI-IM occasion for interference measurement no later than CSI reference resource and drops the report otherwise.  When DRX is configured, the UE reports a CSI report only if receiving at least one CSI-RS transmission occasion for channel measurement and CSI-RS and/or CSI-IM occasion for interference measurement in DRX Active Time no later than CSI reference resource and drops the report otherwise.  <Text omitted> |

In addition to what is captured in RAN1#114bis, there is view that the CSI reference resource requirement can still be checked and met by UE for each sub-configuration, such that in the mentioned example the UE shall drop the entire CSI report. This seems to still require some spec update.

Then as mentioned above, the transmission occasion definition may needs to be adapted per the concept of sub-configuration, at least for Type 2 SD. Two alternatives are identified.

* Alt A: Both transmission occasions for channel measurement and interference measurement are per sub-report.
* Alt B: Both transmission occasions for channel measurement and interference measurement are per report.

Fujitsu considers the definition of Tx occasion may be coupled with the CSI dropping behaviour. For example, if the Tx occasion is determined per sub-report, then Alt 2 can be naturally supported. While, Nokia/NSB consider even with Alt A for checking the Tx occasions, UE can still drop the CSI per Alt3.

There are also couple of companies mentioning that the interpretation of “CSI-RS transmission occasion” is the “transmission occasion” of all the CMRs or IMRs configured in the CSI resource setting associated with the CSI report (see [R1-2310468](https://www.3gpp.org/ftp/Meetings_3GPP_SYNC/RAN1/Inbox/R1-2310468.zip)), such that the UE shall drop the entire CSI report according to current specification. In this interpretation, no spec update may be needed. Similarly, one company mention that the below agreement from RAN1#114bis has implied this as well.

***Agreement***

*For CSI report associated with P/SP CSI-RS resource and configured with reportQuantity including RI, when cell DTX is configured*

* *the UE reports a CSI report only if receiving at least one CSI-RS transmission occasion of each P/SP CSI-RS resource for channel measurement and/or interference measurement for the CSI report in cell DTX active period no later than CSI reference resource and drops the report otherwise.*

In summary, view is summarized for the case (with blue clarifications) that a UE configured with CSI report configuration with e.g. two sub-configurations (sub-config#1 and sub-config#2) among the activated/triggered ones, each with e.g. two CSI-RS resources for channel measurement, none of the CSI-RS Tx occasions of sub-config#1 meets the CSI reference resource, i.e. they are later than CSI ref. resource and at least one CSI Tx occasion of sub-config#2 is no later than CSI ref., the UE shall

* Alt 1: report the CSI report, according to current spec
  + Does not work: Fujitsu, Intel, Spreadtrum, Lenovo,
  + Support: vivo, OPPO, Pana (Type 1 SD and/or PD),
* Alt 2: report the sub-report that there is at least one occasion meeting the requirement
  + Huawei/HiSi, Intel (concerning valid DL slot), CMCC, NEC, Docomo, Pana(Type 2 SD), Transsion, Ruijie, CEWiT
* Alt 3: drop the entire CSI report including all sub-report(s)
  + Nokia/NSB, Futurewei, Google, ZTE (without spec impact), Fujitsu, Spreadtrum, CATT, Xiaomi, Samsung, [LGe], Lenovo, MTK, Ericsson
* Alt 4(new): error case
  + QC,

For the moment, FL consider we can separate the discussion/addition of CSI-IM once there is consensus for the latter (and the addition could be easy).

And, if this is a corner case that could be mostly avoided by gNB, it would be simple to not define any UE behaviour. On the other hand, it seems this could happen during e.g. *CSI report (re)configuration, serving cell activation, BWP change, or activation of SP-CSI* as currently specified cases where a legacy CSI report may need to concern. Some clearly UE behaviour seems preferable, or at least clarify how to interpret the CSI report when it contains sub-configurations.

Regarding the agreements made in RAN1#114bis, FL’s understanding is that it concerns the cell DTX operation for CSI reporting in legacy form, i.e. not the CSI report containing sub-reports. Otherwise it should have been also discussed in the session of CSI enhancements instead of in cell DTX/DRX session only.

**###### Proposal**

For a UE configured with CSI report configuration with more than one sub-configurations, among the activated/triggered ones, each with one or more CSI-RS resources for channel measurement, if none of the CSI-RS transmission occasions of at least one sub-configuration is no later than the CSI reference resource, and if at least one CSI-RS transmission occasion of at least one another sub-configuration is no later than CSI reference resource, the UE shall

* Alt 2: report the sub-report that there is at least one occasion meeting the requirement of CSI reference resource
* Alt 3: drop the entire CSI report including all sub-report(s)

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| **Company** | **Alt** | **Comments** |
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1. **Interference measurement procedures**

Issues on whether/how the current specification support CSI-IM/NZP CSI-RS based IM was extensively discussed in the previous meeting. According to the preference provided from contributions,

* CSI-IM is supported
* Huawei/HiSi, ZTE, CMCC, Interdigital, Fujitsu, vivo, xiaomi, Samsung
* No spec update: ZTE, Fujitsu, vivo, xiaomi, Interdigital (?), Samsung
* NZP CSI-RS for IM is supported
* Huawei/HiSi, ZTE, CMCC (except for Type 2 SD only), Interdigital (configuration/association is different depending on whether L1-SINR is reported), Docomo (preferred for PD only), Samsung, CEWiT (not for Type 2 SD),
  + Sub-alt: to support sub-configuration-wise association in addition to resource-wise association: Huawei/HiSi,
  + Sub-alt: to support an additional power offset for NZP CSI-RS for IM: IDG
* No spec update: CATT, Samsung, Fujitsu,
* No support of NZP CSI-RS based IM for NES / Leave the support, of NZP CSI-RS based IM for NES to implementation
* vivo, xiaomi, Ericsson,

Although there are a few companies mentioning that NZP CSI-RS for IM is mainly used for MU-MIMO and light load is not the main use case of MU, there seem to be possibility, according to submitted TPs, that the current specification can be sufficiently kept with only restriction to limit this IM function at least for e.g. PD and/or Type 1 SD adaptation, or with minor update to further include Type 2 SD adaptation. Note that MU-MIMO is not coupled with Type 2 codebook. It would be desirable that the specification does not manually preclude a gNB to benefit NES from MU-MIMO operation whenever possible to include.

**###### Proposal**

* CSI-IM is supported for Rel-18 NES without need of spec update, i.e. resource-wise association is maintained between NZP CSI-RS for CM and CSI-IM.
* NZP CSI-RS for IM is supported for Rel-18 NES with the following
  + Alt 1: without need of spec update
  + Alt 2: limiting to [Type 1 SD and/or] PD adaptation
  + Alt 3: exception for Type 2 SD adaptation with L1-SINR reporting
  + Alt 4: each NZP CSI-RS resource for IM associated with a NZP CSI-RS resource for CM per sub-configuration

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| **Company** | **Alt** | **Comments** |
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1. **Configuration restrictions for sub-configuration**

The following is recorded as one potential issue related to configuration restriction for SD and/or PD techniques.

***For RAN1#115:***

* *For Type 2 SD adaptation or joint operation of Type 2 SD and PD adaptation, whether the list of NZP CSI-RS resources configured for a sub-configuration is identical to or has no intersection with the list of NZP CSI-RS resources configured for the other sub-configuration(s) within the same CSI-ReportConfig.*
  + *Companies are encouraged to check the example as provided in section 2.5 in R1- 2309647*
* *For Type 1 SD adaptation, or joint operation of Type 1 SD and PD adaptation,* 
  + *‘typeI-SinglePanel-codebookSubsetRestriction-i2’ is configured for each sub-configuration*
  + *if a UE is configured with a CSI-ReportConfig with the higher layer parameter reportQuantity set to 'cri-RI-CQI', the UE expects to be configured with higher layer parameter non-PMI-PortIndication in each sub-configuration*
  + *if all the sub-configurations are configured with port antenna subset indication, the codebook subset restriction, ri restriction, N1 and N2 (and Ng when applicable) should be configured separately in each sub-configuration, instead of being configured in CodebookConfig in the CSI report configuration; otherwise, the CodebookConfig should be configured as legacy in the CSI report configuration.*

According to submitted contributions, supported companies are summarized as follows.

For Type 2 SD,

* The list of NZP CSI-RS resources configured for a sub-configuration is identical to or has no intersection with the list of NZP CSI-RS resources configured for the other sub-configuration(s) within the same CSI-ReportConfig, depending on the existing of parameters for PD adaptation
  + Fujitsu, LGe, Ericsson,
* Remove the bracket in Section 5.2.1.4.2 of TS38.214 such that ~~[~~The list of NZP CSI-RS resources is identical to or has no intersection with a list of NZP CSI-RS resources configured for any other sub-configuration(s) within the CSI-ReportConfig.~~]~~
  + Intel, Spreadtrum, Xiaomi, QC,
* No limitation/up to gNB implementation thus no spec update
  + CMCC, Docomo, Pana,

For *non-PMI-PortIndication* issue, for Type 1 SD,

* Support *non-PMI-PortIndication* to be configured, if provided, in each sub-configuration for a CSI report with *reportQuantity* set to 'cri-RI-CQI'
  + - Huawei/HiSi, Nokia/NSB, ZTE, Fujitsu, Xiaomi, Apple, [Pana, up to gNB], Samsung, LGe, [MTK], Ericsson (new RRC parameter)
* If *non-PMI-PortIndication* is not provided,
  + the CSI-RS port indices p\_j^((v) ),j=0,…,v-1 associated with ranks v=1,2,…,P where P is the number of enabled ports in the bitmap [port-subsetIndicator] and p\_j^((v) ) is the j-th enabled port in the bitmap [port-subsetIndicator]
    - Huawei/HiSi, Fujitsu, Xiaomi, Apple, Pana, CMCC, Samsung, LGe, Ericsson
* The configuration of parameter *non-PMI-PortIndication* is per *CSI-ReportConfig*. All sub-configurations share this parameter *non-PMI-PortIndication*. For example, for a sub-configuration with N ports (N is no larger than R which is the max rank indicated by the parameter *non-PMI-PortIndication*), the UE assumes the ports according to the first N ranks in the port indication vector as it ‘sub-port indication’, i.e.,
  + - Fujitsu (mention but may not prefer),
* Do not support *non-PMI-PortIndication*
  + - Fujitsu (mention but may not prefer), Lenovo,
* No spec update
  + - Docomo
* For Type 2 SD with or without PD, the parameter configured in CSI-ReportConfig applies
  + - Apple

For Type 1 SD,

* Support *typeISinglePanel-codebookSubsetRestriction-i2* to be configured in each sub-configuration for a CSI report with *reportQuantity* set to 'cri-RI-i1-CQI'
  + Nokia/NSB, ZTE, Spreadtrum, CMCC, Apple, Samsung, [MTK],
  + No spec update: Docomo, Apple (if not configured in any Type 1 SD sub-configuration)
  + For Type 2 SD with or without PD, the parameter configured in CSI-ReportConfig applies: Apple
* If all the sub-configurations are configured with port antenna subset indication, the codebook subset restriction, ri restriction, N1 and N2 (and Ng when applicable) should be configured separately in each sub-configuration, instead of being configured in CodebookConfig in the CSI report configuration; otherwise, the CodebookConfig should be configured as legacy in the CSI report configuration.
  + ZTE, CMCC, Apple, [Samsung], MTK,
  + NO: Spreadtrum (‘n1-n2’ should be kept as per CSI-ReportConfig),
* If a *CSI-ReportConfig* that contains a mix of sub-configuration(s), wherein some sub-configuration(s) correspond to 'typeI-SinglePanel' and some other sub-configuration(s) correspond to 'typeI-MultiPanel', each sub-configuration can be configured with the higher layer parameter *codebookMode*.
  + Apple, Samsung

For Type 2 SD adaptation, it seems natural that gNB should configure the resource list and/or power offset such that no intersection of resources among sub-configurations. On the other hand, allowing such configuration possibility is probably the simplest approach to take at maintenance phase without technical issues.

For Type 1 SD adaptation, resource configuration restrictions or without PD, majority supports *non-PMI-PortIndication* issue, if configured, to be provided in each sub-configuration for a CSI report with *reportQuantity* set to 'cri-RI-CQI'. Also a relative large support is observed for *typeISinglePanel-codebookSubsetRestriction-i2* to be configured in each sub-configuration.

Another raised RRC parameter is the *codebookMode*, which concerns the scenario of mixture of sub-configurations, each corresponding to either single or multiple panel configuration.

**###### Proposal**

1. **For Type 2 SD adaptation or joint operation of Type 2 SD and PD adaptation,**
   * + It is up to gNB configuration whether or not the list of NZP CSI-RS resources configured for a sub-configuration is identical to or has no intersection with the list of NZP CSI-RS resources configured for the other sub-configuration(s) within the same CSI-ReportConfig.
     + The *non-PMI-PortIndication*, or *typeISinglePanel-codebookSubsetRestriction-i2* can be configured in CSI-ReportConfig instead of in sub-configuration.

**2) For Type 1 SD adaptation, or joint operation of Type 1 SD and PD adaptation**, for a CSI report with *reportQuantity* set to 'cri-RI-CQI',

* + - UE expects that *non-PMI-PortIndication*[/new RRC parameter], if configured, to be configured in each sub-configuration
    - If *non-PMI-PortIndication*[/new RRC parameter] is not configured, UE assumes that the CSI-RS port indices p\_j^((v) ),j=0,…,v-1 associated with ranks v=1,2,…,P where P is the number of enabled ports in the bitmap *port-subsetIndicator* and p\_j^((v) ) is the j-th enabled port in the bitmap *port-subsetIndicator*

**3) For Type 1 SD adaptation, or joint operation of Type 1 SD and PD adaptation**,

* + - For a CSI report with *reportQuantity* set to 'cri-RI-i1-CQI', UE expects that *typeISinglePanel-codebookSubsetRestriction-i2* to be configured in each sub-configuration that contains *port-subsetIndicator*
    - For the sub-configurations that the codebook subset restriction, ri restriction, N1 and N2 (and Ng, when applicable) are not configured, the *CodebookConfig* in legacy CSI report configuration applies
    - If there is at least one sub-configuration corresponding to 'typeI-SinglePanel' and at least one sub-configuration corresponding to 'typeI-MultiPanel' in the same CSI report configuration, UE expects that *codebookMode* to be configured in each sub-configuration that contains *port-subsetIndicator*

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| **Company** | **Comments** |
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1. **Determination of X for active CSI resource/antenna ports counting**

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| **Agreement@114**  For a CSI report configuration containing sub-configuration(s), if a CSI-RS resource is referred by M sub-configurations among X sub-configurations, the CSI-RS resource is counted M times and CSI-RS ports within the CSI-RS resource are counted by   * Option 2A: for Type 1 SD adaptation, and for Type 2 SD or PD adaptation. * is nrofPorts configured in NZP-CSI-RS-Resource and is the number of CSI-RS ports in sub-configuration s derived from port subset indication. * - It is understood that further discussions are necessary |

The determination of X value in the above agreement remain unresolved.

Current specification for legacy CSI report supports the following combinations, with the highlighted scenarios being controversial for X interpretation for NES.

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| **CSI-RS resource and CSI Report Combination** | P-CSI Report | SP-CSI Report | A-CSI Report |
| P-CSI-RS | RRC | PUCCH: Trigger by MAC-CE  PUSCH: Trigger by DCI | Trigger by DCI |
| SP-CSI-RS | Not supported | PUCCH: Trigger by MAC-CE  PUSCH: Trigger by DCI | Trigger by DCI |
| A-CSI-RS | Not supported | Not supported | Trigger by DCI |

Companies view does not seem to change according to the submitted contributions, as below

Huawei, HiSilicon, Nokia/NSB, Spreadtrum, CATT, FUTUREWEI, NEC, Pana, Ruijie, Lenovo (conditioned by N<=2), CEWiT, CMCC, Ericsson consider that

* X=N the number of triggered sub-configurations for AP/SP CSI report configuration.
* X=L for P CSI report configuration.

vivo, ZTE, Fujitsu, xiaomi, Samsung, CTC, Apple, LGe, MTK, QC consider that

* X=N for the sub-configurations associated with A-CSI-RS resource(s)
* X=L for the sub-configurations associated with SP/P-CSI-RS resource(s)

Intel suggests a compromise to support X=N for SP-CSI-RS resources if CSI on PUCCH. Huawei, HiSilicon also mentions that depending on the triggering method, there may be different values although no compromise is provided along with that.

Spreadtrum considers to clarify “the number of CSI-RS ports for a configured CSI-RS resource is counted once in the configured CSI-RS resource when the configured CSI-RS resource is referred by M sub-configurations”, for the maximum number of CSI-RS ports for a configured CSI-RS resource.

Also a few companies mention to support the following UE capabilities, and if introduced specifically for NES as said by MTK, should be per-band reported,

* Simultaneous ports at least for per CC
* Simultaneous resources at least for per CC

While Apple, Panasonic, MTK, QC consider the legacy UE capability (including value range) of *maxNumberSimultaneousNZP-CSI-RS-PerCC* and *totalNumberPortsSimultaneousNZP-CSI-RS-PerCC* should be maintained. Note that, there could be possibility that a UE support larger values for the above, if introduced, dedicated for NES purpose since the CSI report framework for NES is optimized/simplified compared to legacy multiplexing of multiple CSI reports.

Apart from the upper bound of the value supported by the existing UE capability, the lower bound can be increased for NES purpose such that more promising amount of savings could be expected. This is proposed by Samsung, Ericsson.

**###### Proposal**

1. Support X=L for P-CSI report for sub-configurations associated with P-CSI-RS resource(s)
2. Support X=N for AP-CSI report for sub-configurations associated with AP-CSI-RS resource(s)
3. Determine a resolution for X for AP/SP CSI report for sub-configurations associated with P/SP-CSI RS resource(s)
   * Alt 1: the determination of X is based on resource type of CSI-RS
   * Alt 2: the determination of X is based on report type of CSI report
   * Alt 3: the determination of X is based on resource type of CSI-RS and triggering method (i.e. MAC-CE or DCI)/feedback channel (i.e. PUCCH or PUSCH)
4. Discuss the need to introduce to the following UE capabilities/components dedicated for NES,
   * Simultaneous ports at least for per CC
   * Simultaneous resources at least for per CC
   * Discuss the interaction of the new capabilities with the legacy capability of maxNumberSimultaneousNZP-CSI-RS-PerCC and totalNumberPortsSimultaneousNZP-CSI-RS-PerCC
5. Discuss the need of increasing the lower bound of supported maximum number of active resources/ports dedicated for NES

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| **Company** | **Supported bullet(s), e.g. 1) and Alt 1.** | **Comments** |
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1. **Further clarification on CSI processing criteria**

Apart from the Issue 4 for determination of value of the X, the current specification of active resource counting does not consider the case of joint SD and PD adaptation due to the use of “each”. Also the definition of Ps may not be accurate considering the relevant sub-configurations may not be from the M sub-configurations and may not be from Type 1 SD.

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| TS 38.214 **5.2.1.6 CSI processing criteria** If a CSI-RS resource is referred *N* times by one or more CSI Reporting Settings, the CSI-RS resource and the CSI-RS ports within the CSI-RS resource are counted *N* times.  For a CSI-RS Resource Set for channel measurement configured with two Resource Groups and N Resource Pairs, if a CSI-RS resource is referred X times by one of the M CSI-RS resources, where M is defined in clause 5.2.1.4.2, and/or one or two Resource Pairs, the CSI-RS resource and the CSI-RS ports within the CSI-RS resource are counted X times.  For a CSI report configuration containing sub-configuration(s) indicated in a *CSI-ReportConfig,* if a CSI-RS resource is referred by *M* sub-configurations among *X* sub-configurations, the CSI-RS resource is counted *M* times and the CSI-RS ports within the CSI-RS resource are counted as follows:  - if each sub-configuration, of the *M* sub-configurations, is configured with a CSI-RS antenna port subset, provided by [*port-subsetIndicator*],  - *M* × *P* if each sub-configuration, of the *M* sub-configurations, is configured with a list of one or more CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*], [and/] or is configured with a power offset, provided by *[powerOffset]*,  Where *P* is the number of ports configured by *nrofPorts* and is the number of CSI-RS ports in sub-configuration *s* derived from the corresponding antenna port subset indicator [*port-subsetIndicator*] according to clause 5.2.1.4.2.  <omitted text> |

ZTE/CATT proposed a TP for correcting the relevant parts. Xiaomi, LGe share the same view that joint operation should be considered. LGe also see the need of spec update of counting when a UE indicates a smaller value than configured value in the SP-CSI report configuration, e.g. counting rule should be based on min(M, K) where K is the indicated max value of N.

Vivo, Ericsson provided TPs where the TP from vivo uses more precise texts such that the formula of counting would be applicable to all cases.

See all relevant TPs in Appendix Issue 5.

**###### Proposal**

Endorse a TP (to be provided later) concerning the joint operation of SD and PD, with proper definition of Ps.

Possibly apart from the interpretation of X values for endorsement firstly, companies are invited to share your comments/preference for completion/improvement of the TPs.

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| **Company** | **Preferred TP as starting point** | **Comments** |
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1. **CSI omission/multiplexing of Part 2 wideband and Part 1 CSI**

The following is recorded for RAN1#115

***For RAN1#115***

* *Further check whether there is any issue according to the current specification that, for the CSI mapping of a CSI report configuration having L sub-configurations, Part 2 wideband CSIs have the same priority and are dropped per sub-configuration level in the ascending order of sub-configuration index.*
* *Further check whether part 1 CSI can already be dropped in legacy for a CSI report configuration, and if so, then Part 1 CSIs are dropped per sub-configuration level, in the ascending order of sub-configuration index.*
* *Companies are encouraged to provide TPs for necessary changes*

The first issue is to determine the CSI omission/dropping for the above.

Part 1 CSI is dropped at report level

* Nokia/NSB, vivo, [CATT?], Transsion, Lenovo, [MTK]

Part 1 CSI is dropped at sub-report level

* ZTE, Fujitsu, OPPO, NEC, CTC, Apple, Pana, Samsung (only for CSI on PUCCH), LGe, Ericsson, CEWiT

Part 2 wideband CSIs for all CSI sub-reports and/or CSI reports that have the same priority are omitted together

* Huawei/HiSi, Nokia/NSB, ZTE, Fujitsu, vivo, [CATT?], xiaomi, Apple, Samsung, LGe, Lenovo

Part 2 wideband CSIs are omitted per sub-report level in the ascending order of sub-configuration index

* Intel, OPPO, NEC, CTC, Pana, [MTK], Ericsson (no spec impact),

A second issue: the multiplexing of Part 1/2 CSI in the context of CSI sub-report may require some clarification in specifications. TPs are directly proposed by ZTE as shown in Issue 6 of Appendix.

A third issue: Intel consider it would be worthwhile to clarify in the specification that all CSIs of a priority level is omitted, then next omission is performed in the next higher priority level. TP#6 for Issue 6 is captured in Appendix.

**###### Proposal**

For CSI report with multiple sub-configurations,

* sub-report level omission for one-part CSI or Part 1 CSI (on PUCCH) is supported:
  + When a CSI report with only one part/part 1 CSI is determined as the lowest priority and to be omitted,
    - if the CSI report is a legacy report, the report is omitted.
    - if the CSI report has more than one sub-report, the omission is done sub-report by sub-report according to the indexes of their corresponding sub-configurations.
* Do not support sub-report level omission for Part 2 wideband CSI

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| **Company** | **Comments** |
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1. **Antenna port limitation per resource set**

In TS38.214, the restrictions on CSI-RS resource configuration are shown as below.

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| TS38.214 5.2.1.4.2 Report Quantity Configurations (s-TRP) ...  If the UE is configured with a *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to 'cri-RSRP', 'cri-RI-PMI-CQI ', 'cri-RI-i1', 'cri-RI-i1-CQI', 'cri-RI-CQI', 'cri-RI-LI-PMI-CQI', 'cri-SINR', or 'cri-SINR- Index ', and resources are configured in the corresponding resource set for channel measurement, then the UE shall derive the CSI parameters other than CRI conditioned on the reported CRI, where CRI *k* (*k* ≥ 0) corresponds to the configured (*k*+1)-th entry of associated *nzp-CSI-RS-Resources* in the corresponding *NZP-CSI-RS-ResourceSet* for channel measurement, and (*k*+1)-th entry of associated *csi-IM-Resource* in the corresponding *csi-IM-ResourceSet* (if configured) or (*k*+1)-th entry of associated *nzp-CSI-RS-Resources* in the corresponding *NZP-CSI-RS-ResourceSet* (if configured for *CSI-ReportConfig* with *reportQuantity* set to 'cri-SINR' or 'cri-SINR- Index ') for interference measurement. If CSI-RS resources are configured, each resource shall contain at most 16 CSI-RS ports. If CSI-RS resources are configured, each resource shall contain at most 8 CSI-RS ports. |
| TS 38.214  5.2.1.4.2 Report Quantity Configurations (In R17 m-TRP, the number of TPRs=1,2)  ...  If the UE is configured with a *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to 'cri-RI-PMI-CQI', or 'cri-RI-LI-PMI-CQI' and the corresponding *NZP-CSI-RS-ResourceSet* for channel measurement is configured with resources, two Resource Groups with resources in Group 1, resources in Group 2, , and Resource Pairs:  - each resource can contain, subject to UE capability, at most 32 CSI-RS ports. For two Resource Groups with resources (i=1,2), if , the resource in NZP-CSI-RS-ResourceSet shall contain at most 32 CSI-RS ports; if , each resource in NZP-CSI-RS-ResourceSet shall contain at most 16 CSI-RS ports; if , each resource in NZP-CSI-RS-ResourceSet shall contain at most 8 CSI-RS ports. |
| TS 38.214  5.2.1.4.2 Report Quantity Configurations (In R18 m-TRP, the number of TPRs=1,2,3,4)  ...  If the UE is configured with a *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to 'cri-RI-PMI-CQI', *codebookType* set to 'typeII-CJT-r18' or 'typeII-CJT-PortSelection-r18' and the corresponding *NZP-CSI-RS-ResourceSet* for channel measurement is configured with resources, each resource can contain, at most, 32 CSI-RS ports. |

The following alternatives are observed.

Alt 1: Clarify that the following restriction in TS 38.214 is applied on each sub-configuration for a CSI report containing *L* sub-configurations:

*‘If CSI-RS resources are configured, each resource shall contain at most 16 CSI-RS ports. If CSI-RS resources are configured, each resource shall contain at most 8 CSI-RS ports’*

* ZTE, Transsion,

Alt 2: Extend the current total number of antenna ports to [64] ports for the CSI-RS resources within a resource set, or define a larger threshold of the number of resources for different number of CSI-RS ports, similar to M-TRP. This is subject to a separate UE capability.

* ZTE, CTC,

Alt 3: No consensus to make changes to current RAN1 spec

* CATT, Xiaomi,

Alt 4 (new): The maximum number of ports corresponding to each of the L sub-configurations is used for the determination of the number of antenna ports and the maximum number of resources corresponding to each of the L sub-configurations is used for the determination of the number of CSI-RS resources.

* Samsung

FL considers a relevant/pre-requisiting discussion is whether a sub-report for NES can be viewed as if it is a legacy CSI report, and in such case, how Alt 1 would be different from multiplexing of legacy CSI reports. If Alt 1 can be taken, Alt 2 would be also a natural consequence.

**###### Proposal**

Discuss the difference of multiplexing of multiple legacy CSI reports and one CSI report containing multiple CSI sub-reports, with respect to the following restriction for each legacy CSI report

* *If CSI-RS resources are configured, each resource shall contain at most 16 CSI-RS ports. If CSI-RS resources are configured, each resource shall contain at most 8 CSI-RS ports*

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| **Company** | **Comments** |
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1. **CRI reporting/CRI bitwidth**

The following was discussed in RAN1#114bis and re-proposed by proponents including Nokia/NSB. The discussion in RAN1#114bis was that it is already reflected by current specifications given the determination of CRI field in TS 38.212.

*For CRI reporting for Type 1/Type 2 SD adaptation, support the following legacy behavior but now per CSI report sub-configuration as follows:*

* *If a sub-configuration includes or is associated with more than one CSI-RS resource (for channel measurements), then CRI selection and thus reporting is needed for that sub-configuration.*
* *Otherwise, if a sub-configuration includes or is associated with a single CSI-RS resource (for channel measurements), then CRI reporting is not needed for that sub-configuration.*

Fujitsu also see the need to interpret the CRI on CMR/CSI-IM properly, and separately for Type 1 and Type 2 SD respectively.

Docomo, Samsung proposed a TP for capturing the determination of CRI for Type 2 SD in TS 38.214 in addition to what has been captured in TS 38.212.

**###### Proposal**

Discuss whether/how to clarify CRI determination and reporting for a CSI report with sub-configurations, each associated with one or more CMRs.

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| **Company** | **Comments** |
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1. **Port indexing for CQI calculation**

Antenna port re-indexing was discussed and agreed for PMI derivation.

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| -**5.2.1.4.2 Report Quantity Configurations**  --------------------------------------------------- Unchanged text is omitted ---------------------------  If the UE is configured with a *CSI-ReportConfig* that contains a list of sub-configurations, provided by the higher layer parameter [*csi-ReportSubConfigList]*:   * ~~t~~The UE expects to be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'. If the UE indicates a capability for supporting mixed codebook combination in a slot with [ABC], each sub-configuration can be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'. * ~~-~~ Each sub-configuration can be configured with an antenna port subset using the higher layer bitmap parameter [*port-subsetIndicator*] which contains the bit sequence , where is the MSB and is the LSB, bit corresponds to antenna port , and is the number of ports *nrofPorts* configured for the CSI-RS resources(s) within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement that corresponds to the *CSI-ReportConfig*. A bit value 0 in [*port-subsetIndicator*] indicates that the corresponding antenna port is disabled for the sub-configuration, whereas bit value 1 indicates that the antenna port is enabled and belongs to the antenna port subset for the sub-configuration. For the derivation of PMI, antenna ports corresponding to all bits with value of 1 in [*port-subsetIndicator*] are mapped to consecutive antenna ports starting at CSI-RS antenna port 3000 in increasing order of the bit position in [*port-subsetIndicator*]. |

It was further identified that this may be an issue for CQI calculation as well during CR email approval.

In this meeting, views for the port indexing for CQI calculation are summarized as below,

* there is no need to keep the CSI-RS port indices as consecutive values starting from 3000
  + ZTE
* Port re-indexing is supported also for CQI calculation purpose
  + Fujitsu, Apple, LGe, Ericsson

**###### Proposal**

For a CSI report containing Type 1 SD sub-configuration(s), support port re-indexing to enable consecutive port indices for CQI calculation purpose.

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| **Company** | **Comments** |
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1. **Restrictions on CSI report quantities**

The following is agreed in RAN1#114bis

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| **Agreement@114bis**  Report quantities of 'cri-RSRP', 'cri-SINR', or 'cri-SINR- Index ' are NOT applicable to NES |

Fujitsu further proposes that the 'cri-RSRP-Index' or 'none' are also NOT applicable to NES, since they are either related to BM or can be enabled by exiting CSI reporting.

Google further mentions that due to lack of support for NC-JT, 'TDCP' is not applicable to NES.

Apple considers it is necessary to explicitly list all non-applicable quantities including 'cri-RSRP-Index', 'none', 'ssb-Index-RSRP', 'ssb-Index-SINR', 'ssb-Index-RSRP- Index', 'ssb-Index-SINR- Index' or 'tdcp'.

**###### Proposal**

Report quantities of 'cri-RSRP-Index', 'none', 'ssb-Index-RSRP', 'ssb-Index-SINR', 'ssb-Index-RSRP- Index', 'ssb-Index-SINR- Index' or 'tdcp' are NOT applicable to Rel-18 NES.

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| **Company** | **Comments** |
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1. **CPU occupation time and CSI computation time**

Given the update on CPU counting for NES, the starting position of CPU occupation may require spec update as well since a NES CSI report may contain different number of triggered sub-configurations from the configured number of sub-configurations.

Vivo proposes that the CPU occupation time is still counted based on a CSI-report as legacy behaviour, and the starting position is clarified as follows.

* *For CPU occupation time：*
  + *For periodic CSI report which contains a list of sub-configurations,* 
    - *It occupies CPU(s) from the first symbol of the earliest one of each CSI-RS/CSI-IM/SSB resource for channel or interference measurement within all L configured sub-configurations, respective latest CSI-RS/CSI-IM/SSB occasion no later than the corresponding CSI reference resource, until the last symbol of the configured PUSCH/PUCCH carrying the report.*
  + *For semi-persistent CSI report on PUSCH (excluding an initial semi-persistent CSI report on PUSCH after the PDCCH triggering the report) or semi-persistent CSI report on PUCCH which contains a lsit of sub-configurations*
    - *It occupies CPU(s) from the first symbol of the earliest one of each CSI-RS/CSI-IM/SSB resource for channel or interference measurement within N triggered sub-configurations, until the last symbol of the configured PUSCH/PUCCH carrying the report.*

Docomo propose that for P-/SP-CSI report (except for the initial SP-CSI on PUSCH), the CPU occupation starts from first symbol of earliest CSI-RS/CSI-IM/SSB resource among all reported CSIs, until the last symbol of the configured PUSCH/PUCCH carrying all CSI reports, which seems to be essentially same as vivo’s proposal.

Panasonic considers the CPU occupation duration is defined per CSI report associated with each sub-configuration with the legacy principle, as if each report is a legacy CSI report.

Samsung also consider all triggered sub-configurations should be referred to, not only for CPU occupation time but for CSI computation time.

**###### Proposal**

For CPU occupation time,

* For periodic CSI report which contains a list of sub-configurations,
  + It occupies CPU(s) from the first symbol of the earliest one of each CSI-RS/CSI-IM/SSB resource for channel or interference measurement within all L configured sub-configurations, respective latest CSI-RS/CSI-IM/SSB occasion no later than the corresponding CSI reference resource, until the last symbol of the configured PUSCH/PUCCH carrying the report.
* For semi-persistent CSI report on PUSCH (excluding an initial semi-persistent CSI report on PUSCH after the PDCCH triggering the report) or semi-persistent CSI report on PUCCH which contains a lsit of sub-configurations
  + It occupies CPU(s) from the first symbol of the earliest one of each CSI-RS/CSI-IM/SSB resource for channel or interference measurement within N triggered sub-configurations, until the last symbol of the configured PUSCH/PUCCH carrying the report.

For CSI computation time,

* For a CSI-ReportConfig with sub-configurations, the definition of the corresponding CSI computation time is based on the CSI-RS resources for channel measurement, the CSI-RS resources for interference measurement and the CSI-IM resources for all triggered sub-configurations for AP/SP-CSI report and all configured sub-configurations for P-CSI report.

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| **Company** | **Comments** |
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1. **Applicability of *PowerControlOffset* for TRS**

Google consider that it is necessary for RAN1 to clarify whether the UE assumption on *powerControlOffset* configured in TRS still holds when Rel-18 NES is configured, since it may have impact on RAN4 test. The following two options are provided:

• **Option 1**: The powerControlOffset configured in TRS still indicates the power offset between PDSCH and TRS

* Introduce a L1/L2 signaling to update the powerControlOffset between TRS and PDSCH for UE power saving

• **Option 2**: UE ignores the powerControlOffset configured in TRS

* - The EPRE ratio between SSB/TRS and PDSCH is unknown to the UE
* Send an LS to RAN4 to notify RAN4 the conclusion

This issue was briefly discussed in RAN1#114bis however may not be fully understood by companies.

**###### Proposal**

Companies are invited to share your opinion for the above two options.

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| **Company** | **Preferred Option** | **Comments** |
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1. **Applicability of NC-JT for NES**

Google consider NC-JT shall not be applicable for NES at this stage, and therefore some clarification in specifications is needed.

FL consider with multiple specs lack of mentioning how to support NC-JT operation in case of two resource groups are being configured, e.g. the mapping table of CSI fields in TS38.212, this seems to be commonly understood already.

**###### Proposal**

Companies are invited to share your opinion on the need of further clarification, and if needed, comments to the TP in Appendix Issue 13.

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| **Company** | **Comments** |
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1. **CSI report association with multiple CMR sets**

Google consider specification clarification is necessary,

* For NES, one port subset indicator or a list of CSI-RS resources are configured in each sub-configuration in one CSI report setting which can be associated to multiple CMR sets.
* Then this port subset indicator or resource list should be common configuration for all the configured aperiodic CSI-RS resource sets.

A TP is also provided and captured in Appendix.

FL considers that with the configurations being such that a same sub-configuration is referred by multiple/all CMR sets, it is naturally the situation that the parameter(s), including port subset or resource list, in sub-configurations would have to be common for all associated AP CSI-RS resource sets.

**###### Proposal**

Companies are invited to share your opinion on the need of further clarification, and if needed, comments to the TP in Appendix Issue 14.

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| **Company** | **Comments** |
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1. **Time domain restrictions on CSI-RS resource measurement**

Samsung propose to apply the current time domain restriction to CSI-RS resources for legacy CSI report also to the CSI-RS resources for each CSI sub-report, to gain useful CSI (measured close to each other) of different sub-reports.

FL’s understanding is that such time domain restriction is currently applicable for M-TRP or Type II codebook. However it may be useful if resources for NES’s multi-CSI can be timely close to each other.

**###### Proposal**

Companies are invited to share your opinion on the need of further applying the existing time domain restriction (to CSI-RS resources for legacy CSI report) also to the CSI-RS resources associated with a CSI sub-report for a CSI report containing sub-configuration(s).

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| **Company** | **Comments** |
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1. **Specification alignment**

Lenovo, Ericsson propose to align the spec language in use of CSI ‘sub-report’, which seems natural.

**###### Proposal**

Companies are invited to share your comments to complete/improve/correct the relevant TPs in Appendix Issue 16.

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| **Company** | **Comments** |
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1. **RRC parameters for SD and/or PD adaptation**

The latest RRC parameter list from last RAN1 meeting can be found in [R1-23xxxxx Collection\_Rel-18\_higher\_layer\_parameters\_list-v000.xlsx](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_115/Inbox/drafts/8(NR_R18)/RRC/Collection%20of%20RRC%20parameters/R1-23xxxxx%20Collection_Rel-18_higher_layer_parameters_list-v000.xlsx).

An update of the list can be found in [draft RRC list for NES-v00.xlsx](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_115/Inbox/drafts/8(NR_R18)/RRC/For%20Rapporteur%20Only/%5B115%20-R18-RRC-NES%5D/draft%20RRC%20list%20for%20NES-v00.xlsx) according to the contributions (and also those submitted to agenda item Cell DTXD/DRX session), including but not limited to

Apple: add *non-PMI-PortIndication*, *typeI-SinglePanel-codebookSubsetRestriction-i2* and *codebookMode* in 1a) in Row 3 Column J.

MTK: update RRC parameter name, *powerOffset*, to *powerOffsetNES* so as to reflect its specific use for NES power domain adaptation.

Ericsson: inform RAN2 of the additional RRC parameter *non-PMI-PortIndicationSubConfig* that can be configured within a sub-configuration. A few other comments/updates are provided in Appendix B of [**R1-2312100**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2312100.zip).

Following the related email discussion,

[115-R18-RRC] Email discussion on higher layer signal for Rel-18 – Sorour (Ericsson)

* To be used for sharing updates on online/offline schedule, details on what is to be discussed in online/offline sessions, tdoc number of the moderator summary for online session, etc

Comments are to be collected in this session. Note FL has not updated the list for some of the comments which is pending conclusion first including e.g. configuration restriction issues in Issue 3. And input is expected based on the updated version in yellow above, since there are row changes. One particular issue FL wants to draw attention is that two companies (Fujitsu in R1- 2311052 and Ericsson in R1-2312101) propose that many of the unstable rows/parameters are not needed since the parameter *positionInDCI-cellDRX* is configured per serving cell which provides the linkage for each information block sufficiently.

**###### Proposal**

Company’s comments are invited in this table.

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| **Company** | **Comments** |
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# Reference

|  |  |  |
| --- | --- | --- |
| [**R1-2310863**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2310863.zip) | Maintenance of CSI enhancements for NES | Huawei, HiSilicon |
| [**R1-2310985**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2310985.zip) | Techniques in spatial and power domains | Nokia, Nokia Shanghai Bell |
| [**R1-2310993**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2310993.zip) | Discussion on NES techniques in spatial and power domains | ZTE, Sanechips |
| [**R1-2311051**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311051.zip) | Remaining details on NW energy saving techniques in spatial and power domains | Fujitsu |
| [**R1-2311102**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311102.zip) | Remaining issues on NES techniques in spatial and power domain | vivo |
| [**R1-2311137**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311137.zip) | Maintanence issues of NES spatial and power domain operations | Intel Corporation |
| [**R1-2311170**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311170.zip) | Remaining issues on NES techniques in spatial and power domains | Spreadtrum Communications |
| [**R1-2311243**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311243.zip) | Discussion on remaining issue for techniques in spatial and power domains | OPPO |
| [**R1-2311347**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311347.zip) | Network Energy Saving techniques in spatial and power domain | CATT |
| [**R1-2311358**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311358.zip) | Remaining issues on Spatial NES | FUTUREWEI |
| [**R1-2311413**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311413.zip) | Remaining issues on NES techniques in spatial and power domains | Beijing Xiaomi Mobile Software |
| [**R1-2311487**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311487.zip) | Remaining issues on spatial and power domains enhancements for network energy saving | CMCC |
| [**R1-2311509**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311509.zip) | Remaining issues on network energy saving techniques in spatial and power domains | NEC |
| [**R1-2311535**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311535.zip) | Remaining issues on NES techniques in spatial and power domains | InterDigital, Inc. |
| [**R1-2311546**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311546.zip) | Remaining issues on CSI enhancement for NES | China Telecom |
| [**R1-2311574**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311574.zip) | Network Energy Saving in Spatial and Power Domain | Google |
| [**R1-2311656**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311656.zip) | Maintenance of spatial and power domain enhancements for NW energy savings | NTT DOCOMO, INC. |
| [**R1-2311689**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311689.zip) | On remaining issues for spatial and power domain enhancements to support network energy saving | Apple |
| [**R1-2311763**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311763.zip) | Remaining issues of spatial and power domain adaptation for network energy saving | Panasonic |
| [**R1-2311798**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311798.zip) | Remaining issues of NES techniques in spatial and power domains | Transsion Holdings |
| [**R1-2311849**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311849.zip) | Remaining issues on NES techniques in spatial and power domains | Samsung |
| [**R1-2311895**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311895.zip) | Remaining issues of NES techniques in spatial and power domains | LG Electronics |
| [**R1-2311933**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311933.zip) | Remaining issues on techniques in spatial and power domains | Ruijie Network Co. Ltd |
| [**R1-2311938**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311938.zip) | Maintenance on Network energy saving techniques in spatial and power domains | Lenovo |
| [**R1-2311980**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2311980.zip) | Maintenance on NES techniques in spatial and power domains | MediaTek Inc. |
| [**R1-2312041**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2312041.zip) | Remaining aspects of spatial and power domain adaptation | Qualcomm Incorporated |
| [**R1-2312100**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2312100.zip) | Maintenance of NW energy saving techniques in spatial and power domains | Ericsson |
| [**R1-2312113**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2312113.zip) | Correction on spatial adaptation | ASUSTeK |
| [**R1-2312159**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_115/Docs/R1-2312159.zip) | Remaining issues on techniques in spatial and power domains | CEWiT |

# Appendix

## A. **Submitted** TPs

**Issue 1**

TP#1 from Huawei, HiSilicon

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| **Reason for change:**  For type 2 SD adaptation with or without PD, clarification of CSI dropping rule related to CSI reference resource timing is needed.  **Summary of change:**  Clarification of CSI dropping rule is at sub-configuration level when a UE is requested to report N CSIs corresponding to N sub-configurations while the resources are partially, at sub-configuration level, meeting the CSI reference resource timing requirement.  **Consequence if not approved:**  The UE behaviour will not be specified when the CSI sub-reports corresponding to CSI-RS resource(s) cannot be generated completely by UE if some of these resources arrive later in time than the CSI reference resource.  ---------------------------- Start of Text Proposal 1 for TS 38.214 -----------------------------  < Unchanged parts are omitted >  If there is no valid downlink slot for the CSI reference resource corresponding to a CSI Report Setting in a serving cell, CSI reporting is omitted for the serving cell in uplink slot *n'*.  After the CSI report (re)configuration, serving cell activation, BWP change, or activation of SP-CSI, the UE reports a CSI report only after receiving at least one CSI-RS transmission occasion for channel measurement and CSI-RS and/or CSI-IM occasion for interference measurement no later than CSI reference resource and drops the report otherwise. If a CSI report configuration has a list of sub-configurations, after the CSI report (re)configuration, serving cell activation, BWP change, or activation of SP-CSI, the UE reports a CSI sub-report only after receiving at least one CSI-RS transmission occasion for channel measurement and CSI-RS and/or CSI-IM occasion for interference measurement corresponding to the CSI sub-report no later than the CSI reference resource, and drops the CSI sub-report otherwise.  < Unchanged parts are omitted >  When DRX is configured, the UE reports a CSI report only if receiving at least one CSI-RS transmission occasion for channel measurement and CSI-RS and/or CSI-IM occasion for interference measurement in DRX Active Time no later than CSI reference resource and drops the report otherwise. When DRX is configured and the CSI-RS Resource Set for channel measurement corresponding to a CSI report is configured with two Resource Groups and Resource Pairs, as described in clause 5.2.1.4.1, the UE reports a CSI report only if receiving at least one CSI-RS transmission occasion for each CSI-RS resource in a Resource Pair within the same DRX Active Time no later than CSI reference resource and drops the report otherwise. When the UE is configured to monitor DCI format 2\_6 and if the UE configured by higher layer parameter *ps-TransmitOtherPeriodicCSI* to report CSI with the higher layer parameter *reportConfigType* set to 'periodic' and *reportQuantity* set to quantities other than 'cri-RSRP', 'ssb-Index-RSRP', 'cri-RSRP- Index', and 'ssb-Index-RSRP- Index ' when *drx-onDurationTimer* is not started, the UE shall report CSI during the time duration indicated by *drx-onDurationTimer* in *DRX-Config* also outside active time according to the procedure described in Clause 5.2.1.4 if receiving at least one CSI-RS transmission occasion for channel measurement and CSI-RS and/or CSI-IM occasion for interference measurement during the time duration indicated by drx-onDurationTimer in *DRX-Config* outside DRX active time or in DRX Active Time no later than CSI reference resource and drops the report otherwise. When the UE is configured to monitor DCI format 2\_6 and if the UE configured by higher layer parameter *ps-TransmitPeriodicL1-RSRP* to report L1-RSRP with the higher layer parameter *reportConfigType* set to 'periodic' and *reportQuantity* set to 'cri-RSRP', 'ssb-Index-RSRP', 'cri-RSRP- Index', or 'ssb-Index-RSRP- Index' when *drx-onDurationTimer* is not started, the UE shall report L1-RSRP during the time duration indicated by *drx-onDurationTimer* in *DRX-Config* also outside active time according to the procedure described in clause 5.2.1.4 and when reportQuantity set to 'cri-RSRP' or *'*cri-RSRP- *Index*' if receiving at least one CSI-RS transmission occasion for channel measurement during the time duration indicated by drx-onDurationTimer in *DRX-Config* outside DRX active time or in DRX Active Time no later than CSI reference resource and drops the report otherwise. If a CSI report configuration has a list of sub-configurations, when DRX is configured, the UE reports a CSI sub-report only after receiving at least one CSI-RS transmission occasion for channel measurement and CSI-RS and/or CSI-IM occasion for interference measurement corresponding to the CSI sub-report in DRX Active Time no later than the CSI reference resource, and drops the CSI sub-report otherwise.  When deriving CSI feedback, the UE is not expected that a NZP CSI -RS resource for channel measurement overlaps with CSI-IM resource for interference measurement or NZP CSI -RS resource for interference measurement.  < Unchanged parts are omitted >  --------------------------------------- End of Text Proposal ---------------------------------- |

TP#2 from Fujitsu

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| * **Reason for changes**   How CSI dropping rule based on CSI reference resource in current specification works is unclear in case of type2 SD adaptation where N out of L sub-configurations are triggered.   * **Summary of changes**   CSI transmission occasions for both channel measurement and interference measurement are clarified as transmission occasions of the [activated/triggered] sub-configurations.   * **Consequences if not approved**   The answer to how CSI dropping rule based on CSI reference resource in current specification works is unclear.  ---------------------------------------------------- Start of the TP for TS38.214-------------------------------------------  **5.2.2.5 CSI reference resource definition**  <Unrelated part omitted>  After the CSI report (re)configuration, serving cell activation, BWP change, or activation of SP-CSI, the UE reports a CSI report only after receiving at least one CSI-RS transmission occasion for channel measurement and CSI-RS and/or CSI-IM occasion for interference measurement no later than CSI reference resource and drops the report otherwise.  In case that the UE is configured with a *CSI-ReportConfig* containing sub-configuration(s) where each sub-configuration contains a list of CSI-RS resources, after the CSI report (re)configuration, serving cell activation, BWP change, or activation of SP-CSI, the UE reports a CSI report only after receiving at least one CSI-RS transmission occasion associated to the [activated/triggered] sub-configuration(s) for channel measurement and CSI-RS and/or CSI-IM occasion associated to the [activated/triggered] sub-configuration(s) for interference measurement no later than CSI reference resource and drops the report otherwise.  <Unrelated part omitted>  ---------------------------------------------------- End of the TP for TS38.214------------------------------------------ |

TP#3 from Intel

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| **Reasons for change:**  Ambiguous CSI report/sub-report dropping rules when no valid CSI reference resource exist.  **Summary of change:**  Clarify that CSI within a CSI report containing one or more sub-configurations is dropped when the CSI does not have a corresponding valid CSI reference resource.  **Consequences if not approved:**  Incorrect UE behavior and ambiguous specification. |
| =========== TP for TS38.213 ============= 5.2.2.5 CSI reference resource definition *-- unchanged text omitted --*  If there is no valid downlink slot for the CSI reference resource corresponding to a CSI Report Setting in a serving cell, CSI reporting is omitted for the serving cell in uplink slot *n'*. If a CSI report contains one or more CSIs corresponding to a sub-configuration from list of sub-configurations contained in the *CSI-ReportConfig*, and if there is no valid downlink slot for the CSI reference resource corresponding to a CSI of a sub-configuration of a CSI Report Setting in a serving cell, the CSI of the sub-configuration within a CSI report is omitted for the serving cell in uplink slot *n'*.  *-- unchanged text omitted --* |

TP#4 from CATT

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| 5.2.2.5 CSI reference resource definition ---------------------------------------------------- Unchanged text is omitted ---------------------------------------------------------  After the CSI report (re)configuration, serving cell activation, BWP change, or activation of SP-CSI, the UE reports a CSI report only after receiving at least one CSI-RS transmission occasion for channel measurement and CSI-RS and/or CSI-IM occasion for interference measurement no later than CSI reference resource and drops the report otherwise. Fora *CSI-ReportConfig* configured with a list of sub-configurations, provided by the higher layer parameter [*csi-ReportSubConfigList*], the UE reports a CSI report only after receiving at least one CSI-RS transmission occasion for each of the CSI-RS resources in the corresponding CSI-RS Resource Set for channel measurement and/or one CSI-IM occasion for interference measurement no later than the CSI reference resource and drops the report otherwise.  For a *CSI-ReportConfig* configured with *codebookType* set to 'typeII-CJT-r18' or 'typeII-CJT-PortSelection-r18', the UE reports a CSI report only after receiving at least one CSI-RS transmission occasion for each of the CSI-RS resources in the corresponding CSI-RS Resource Set for channel measurement and/or one CSI-IM occasion for interference measurement no later than the CSI reference resource and within the same DRX Active Time, when DRX is configured, and drops the report otherwise.  ---------------------------------------------------- Unchanged text is omitted -------------------------------------------------------- |

TP#5 from Google

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| 5.2.2.5 CSI reference resource definition <omitted text>  After the CSI report (re)configuration, serving cell activation, BWP change, or activation of SP-CSI, the UE reports a CSI report only after receiving at least one CSI-RS transmission occasion for channel measurement and CSI-RS and/or CSI-IM occasion for interference measurement no later than CSI reference resource and drops the report otherwise, except when a list of sub-configurations is contained in the *CSI-ReportConfig* as described in Clause 5.2.1.1.  When a list of sub-configurations is contained in the *CSI-ReportConfig*, after the CSI report (re)configuration, serving cell activation, BWP change, or activation of SP-CSI, the UE reports a CSI report only after receiving at least one CSI-RS transmission occasion for channel measurement and CSI-RS and/or CSI-IM occasion for interference measurement no later than CSI reference resource for the triggered sub-configurations and drops the report otherwise.  <omitted text> |

TP#6 from Ericsson

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| * Reason for changes   + CSI report dropping rules related to the CSI reference resource are undefined for the case of a *CSI-ReportConfig* containing sub-configurations. * Summary of changes   + Define CSI report dropping rules related to the CSI reference resource are undefined for the case of a *CSI-ReportConfig* containing sub-configurations. * Consequences if not approved   + Undefined UE behavior for CSI report dropping rules related to the CSI reference resource are undefined for the case of a *CSI-ReportConfig* containing sub-configurations.   -------------------------------- Text Proposal (TP#6) for 38.214, Section 5.2.2.5 -----------------------------------  \*\*\* Unchanged text omitted \*\*\*  If there is no valid downlink slot for the CSI reference resource corresponding to a CSI Report Setting in a serving cell, CSI reporting is omitted for the serving cell in uplink slot *n'*.  After the CSI report (re)configuration, serving cell activation, BWP change, or activation of SP-CSI, the UE reports a CSI report only after receiving at least one CSI-RS transmission occasion for channel measurement and CSI-RS and/or CSI-IM occasion for interference measurement no later than CSI reference resource and drops the report otherwise.  For a *CSI-ReportConfig* configured with *codebookType* set to 'typeII-CJT-r18' or 'typeII-CJT-PortSelection-r18', the UE reports a CSI report only after receiving at least one CSI-RS transmission occasion for each of the CSI-RS resources in the corresponding CSI-RS Resource Set for channel measurement and/or one CSI-IM occasion for interference measurement no later than the CSI reference resource and within the same DRX Active Time, when DRX is configured, and drops the report otherwise.  For a *CSI-ReportConfig* configured with *codebookType* set to 'typeII-Doppler-r18' or 'typeII-Doppler-PortSelection-r18', the UE reports a CSI report only if receiving at least one aperiodic or periodic or semipersistent consecutive CSI-RS transmission occasions for each CSI-RS resource in the corresponding CSI-RS Resource Set for channel measurement and/or one CSI-IM occasion for interference measurement no later than the CSI reference resource and within the same DRX Active Time, when DRX is configured, and drops the report otherwise. The value of is indicated by UE capability, as defined in clause 5.2.1.6.  When DRX is configured, the UE reports a CSI report only if receiving at least one CSI-RS transmission occasion for channel measurement and CSI-RS and/or CSI-IM occasion for interference measurement in DRX Active Time no later than CSI reference resource and drops the report otherwise. When DRX is configured and the CSI-RS Resource Set for channel measurement corresponding to a CSI report is configured with two Resource Groups and Resource Pairs, as described in clause 5.2.1.4.1, the UE reports a CSI report only if receiving at least one CSI-RS transmission occasion for each CSI-RS resource in a Resource Pair within the same DRX Active Time no later than CSI reference resource and drops the report otherwise. When the UE is configured to monitor DCI format 2\_6 and if the UE configured by higher layer parameter *ps-TransmitOtherPeriodicCSI* to report CSI with the higher layer parameter *reportConfigType* set to 'periodic' and *reportQuantity* set to quantities other than 'cri-RSRP', 'ssb-Index-RSRP', 'cri-RSRP- Index', and 'ssb-Index-RSRP- Index ' when *drx-onDurationTimer* is not started, the UE shall report CSI during the time duration indicated by *drx-onDurationTimer* in *DRX-Config* also outside active time according to the procedure described in Clause 5.2.1.4 if receiving at least one CSI-RS transmission occasion for channel measurement and CSI-RS and/or CSI-IM occasion for interference measurement during the time duration indicated by *drx-onDurationTimer* in *DRX-Config* outside DRX active time or in DRX Active Time no later than CSI reference resource and drops the report otherwise. When the UE is configured to monitor DCI format 2\_6 and if the UE configured by higher layer parameter *ps-TransmitPeriodicL1-RSRP* to report L1-RSRP with the higher layer parameter *reportConfigType* set to 'periodic' and *reportQuantity* set to 'cri-RSRP', 'ssb-Index-RSRP', 'cri-RSRP- Index', or 'ssb-Index-RSRP- Index' when *drx-onDurationTimer* is not started, the UE shall report L1-RSRP during the time duration indicated by *drx-onDurationTimer* in *DRX-Config* also outside active time according to the procedure described in clause 5.2.1.4 and when *reportQuantity* set to '*cri-RSRP'* or *'cri-RSRP*- *Index'* if receiving at least one CSI-RS transmission occasion for channel measurement during the time duration indicated by *drx-onDurationTimer* in *DRX-Config* outside DRX active time or in DRX Active Time no later than CSI reference resource and drops the report otherwise.  For a *CSI-ReportConfig* associated with periodic or semi-persistent CSI-RS resources that contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], the relevant dropping procedures in this clause apply for a CSI report containing one or more CSI sub-reports, except the UE reports the CSI report only only after receiving at least one CSI-RS transmission occasion for channel measurement and CSI-RS and/or CSI-IM occasion for interference measurement per corresponding sub-configuration no later than CSI reference resource and drops the report otherwise.  When deriving CSI feedback, the UE is not expected that a NZP CSI -RS resource for channel measurement overlaps with CSI-IM resource for interference measurement or NZP CSI -RS resource for interference measurement.  \*\*\* Unchanged text omitted \*\*\*  ----------------------------------------------------------- End Text Proposal ---------------------------------------------------------- |

**Issue 2**

TP#1 from Huawei, HiSilicon

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| **Consequence if not approved:**  If the change is not approved, for NES, misinterpretations or improper implementation on how to configure CSI-IM resource and NZP CSI-RS resource for interference measurement could happen.  ---------------------------- Start of Text Proposal 2 for TS 38.214 -----------------------------  < Unchanged parts are omitted >  **5.2.1.4.1 Resource Setting configuration**  < Unchanged parts are omitted >  A UE is not expected to be configured with more than one CSI-RS resource in resource set for channel measurement for a *CSI-ReportConfig* with the higher layer parameter *codebookType* set to 'typeII', 'typeII-PortSelection', 'typeII-r16', 'typeII-PortSelection-r16', or 'typeII-PortSelection-r17'. A UE is not expected to be configured with more than 64 NZP CSI-RS resources and/or SS/PBCH block resources in resource setting for channel measurement for a *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to 'none', 'cri-RI-CQI', 'cri-RSRP', 'ssb-Index-RSRP', 'cri-SINR' or 'ssb-Index-SINR', 'cri-RSRP- Index', 'ssb-Index-RSRP- Index', 'cri-SINR- Index' or 'ssb-Index-SINR- Index'. If interference measurement is performed on CSI-IM, each CSI-RS resource for channel measurement is resource-wise associated with a CSI-IM resource by the ordering of the CSI-RS resource and CSI-IM resource in the corresponding resource sets. If a NZP CSI-RS resource configured by *nzp-CSI-ResourceId* for channel measurement is associated with *L* sub-configurations and each sub-configuration contains [*port-subsetIndicator*], *L* CSI-RS resources for channel measurement corresponding to *L* sub-configurations are associated to the CSI-IM resource that is associated with the NZP CSI-RS resource. The number of NZP CSI-RS resources in a resource set for channel measurement equals to the number of CSI-IM resources.  A UE configured with a *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to 'cri-RI-PMI-CQI' and *codebookType* set to 'typeII-CJT-r18' or 'typeII-CJT-PortSelection-r18' is expected to be configured with CSI-RS resources in a resource set for channel measurement. If interference measurement is performed on CSI-IM, only one resource is configured in the corresponding *csi-IM-ResourceSet*.  A UE configured with a *CSI-ReportConfig* with the higher layer parameter N4 and *reportQuantity* set to 'cri-RI-PMI-CQI', is expected to be configured with aperiodic CSI-RS resources or with a single periodic or semi-persistent CSI-RS resource in the resource set for channel measurement. For an aperiodic CSI-RS resource set for channel measurement, the CSI-RS resources are triggered by the same triggering instance and the separation between two consecutive CSI-RS resources is slots, which is configured by higher layer parameter in the *NZP-CSI-RS-ResourceSet*. The UE shall assume that the antenna port with the same port index of the aperiodic CSI-RS resources is the same. If interference measurement is performed on CSI-IM, only one resource is configured in the corresponding *csi-IM-ResourceSet*.  An NZP CSI-RS Resource Set for channel measurement with resources can be configured with two Resource Groups, with resources in Group 1 and resources in Group 2, such that , and with Resource Pairs. Each Resource Pair consists of one resource from Group 1 and one resource from Group 2. The same resource can be associated with two Resource Pairs in frequency range 1 but not in frequency range 2.  A subset of resources, where a subset contains one or more resources, of a NZP CSI-RS Resource Set for channel measurement corresponds to a sub-configuration contained in a *CSI-ReportConfig* if each of the sub-configuration(s) contains a list of one or more NZP CSI-RS resources, or all the resources of a NZP CSI-RS Resource Set for channel measurement correspond to each of the sub-configuration(s) contained in a *CSI-ReportConfig* if each of the sub-configurations does not contain a list of NZP CSI-RS resources, as described in Clause 5.2.1.4.2.  Except for L1-SINR, if interference measurement is performed on NZP CSI-RS, a UE does not expect to be configured with more than one NZP CSI-RS resource in the associated resource set within the resource setting for interference measurement. Except for L1-SINR, the UE configured with the higher layer parameter *nzp-CSI-RS-ResourcesForInterference* may expect no more than 18 NZP CSI-RS ports configured in a NZP CSI-RS resource set. If CSI report configuration has a list of sub-configurations and interference measurement is performed on NZP CSI-RS, *L* NZP CSI-RS resources are contained in the resource set for interference measurement and the *L* NZP CSI-RS resources are associated to *L* sub-configurations by the ordering of the *L* NZP CSI-RS resources in resource set and sub-configurations in CSI report configuration.  < Unchanged parts are omitted >  --------------------------------------- End of Text Proposal ---------------------------------- |

TP#2 from vivo

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| * Reason for changes   + NZP based IMR is not supported in R18 NES if agreed. * Summary of changes   + Adding one sentence to cover above issue. * Consequences if not approved   + It is unclear that whether NZP based IMR is supported or not in R18. * Text proposal for NZP based IMR in NES is shown in the following.  |  | | --- | | **TS 38.214 V18.0.0**  5.2.1.4.2 Report Quantity Configurations  \*\*\* Unchanged text is omitted \*\*\*  Except for a *CSI-ReportConfig* configured with *reportQuantity* set to 'cri-RI-PMI-CQI' and *codebookType* set to 'typeII-CJT-r18', 'typeII-CJT-PortSelection-r18', 'typeII-Doppler-r18', or 'typeII-Doppler-PortSelection-r18', if the UE is configured with a *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to 'cri-RSRP', 'cri-RI-PMI-CQI ', 'cri-RI-i1', 'cri-RI-i1-CQI', 'cri-RI-CQI', 'cri-RI-LI-PMI-CQI', 'cri-SINR', or 'cri-SINR- Index ', and resources are configured in the corresponding resource set for channel measurement, then the UE shall derive the CSI parameters other than CRI conditioned on the reported CRI, where CRI *k* (*k* ≥ 0) corresponds to the configured (*k*+1)-th entry of associated *nzp-CSI-RS-Resources* in the corresponding *NZP-CSI-RS-ResourceSet* for channel measurement, and (*k*+1)-th entry of associated *csi-IM-Resource* in the corresponding *csi-IM-ResourceSet* (if configured) or (*k*+1)-th entry of associated *nzp-CSI-RS-Resources* in the corresponding *NZP-CSI-RS-ResourceSet* (if configured for *CSI-ReportConfig* with *reportQuantity* set to 'cri-SINR' or 'cri-SINR- Index ') for interference measurement. If CSI-RS resources are configured, each resource shall contain at most 16 CSI-RS ports. If CSI-RS resources are configured, each resource shall contain at most 8 CSI-RS ports. The UE is not expected to be configured with NZP CSI-RS for interference measurement for a *CSI-ReportConfig* if the *CSI-ReportConfig* is configured with a list of *csi-ReportSubConfig*s.  If the UE is configured with a *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to 'cri-RI-PMI-CQI', *codebookType* set to 'typeII-CJT-r18' or 'typeII-CJT-PortSelection-r18' and the corresponding *NZP-CSI-RS-ResourceSet* for channel measurement is configured with resources, each resource can contain, at most, 32 CSI-RS ports.  \*\*\* Unchanged text is omitted \*\*\* | |

**Issue 3**

TP#1 from Huawei, HiSilicon

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| **Summary of change:**  For type 1 SD adaptation with 'cri-RI-CQI', the higher layer parameter non-PMI-PortIndication can be configured in each sub-configuration. If non-PMI-PortIndication is not configured in a sub-configuration, then the UE assumes that the CSI-RS port indices associated with ranks where is the number of enabled ports in the bitmap [*port-subsetIndicator*] and is the j-th enabled port in the bitmap [*port-subsetIndicator*].  **Consequence if not approved:**  In current spec, r antenna ports may not belong to the antenna port subset of a sub-configuration. So the UE cannot obtain the CSI for this sub-configuration.  ---------------------------- Start of Text Proposal 3 for TS 38.214 -----------------------------  5.2.1.4.2 Report quantity configurations  < Unchanged parts are omitted >  - A sub-configuration can be configured with a power offset provided by [*powerOffse*t].  - If a sub-configurations is not configured with [*nzp-CSI-RS-resourceList*] then the sub-configuration shall be associated with all the NZP CSI-RS resources within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement which corresponds to the *CSI-ReportConfig.*  - the UE reports CSI(s) for one or more sub-configurations according to Clauses 5.2.1.5.1, 5.2.1.5.2, 5.2.3 and 5.2.4, and according to the higher layer parameter *reportQuantity* configured for that *CSI-ReportConfig*.  - The UE does not expect the higher layer parameter *reportQuantity* to be set to ‘cri-RSRP’, ‘cri-SINR’, or ‘cri-SINR- Index'.  - If the UE is configured with the higher layer parameter [*port-subsetIndicator*] and the *reportQuantity* is set to 'cri-RI-CQI', the higher layer parameter *non-PMI-PortIndication* can be configured in each sub-configuration. If the higher layer parameter *non-PMI-PortIndication* is not configured in a sub-configuration, the UE assumes, for each CSI-RS resource in the CSI resource setting linked to the *CSI-ReportConfig*, that the CSI-RS port indices associated with ranks where is the number of enabled ports in the bitmap [*port-subsetIndicator*] and is the j-th enabled port in the bitmap [*port-subsetIndicator*].  If the UE is configured with a *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to 'ssb-Index-RSRP' or 'ssb-Index-RSRP- Index', the UE shall report SSBRI, where SSBRI *k* (*k* ≥ 0) corresponds to the configured (*k*+1)-th entry of the associated *csi-SSB-ResourceList* in the corresponding *CSI-SSB-ResourceSet.*  < Unchanged parts are omitted >  --------------------------------------- End of Text Proposal ---------------------------------- |

TP#2 from ZTE

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| Reason for changes:   * Corrections on higher layer parameters configuration for type 1 SD adaptation. |
| Summary of changes:   * Higher layer parameter ‘typeI-SinglePanel-codebookSubsetRestriction-i2’ is configured per sub-configuration if the reportQuantity is set to ‘cri-RI-i1-CQI’. * Higher layer parameter ‘non-PMI-PortIndication’ is configured per sub-configuration when the reportQuantity is set to 'cri-RI-CQI'. |
| Consequences if not approved   * The configurations of higher layer parameters are unclear. |
| ----------------------------- Text Proposal (TP#7) for TS38.214, Subclause 5.2.1.4.2 --------------------------- 5.2.1.4.2 Report quantity configurations <omitted text>  If the UE is configured with a *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to 'cri-RI-CQI',  - if the UE is configured with higher layer parameter *non-PMI-PortIndication* contained in a *CSI-ReportConfig* or in a sub-configuration in a *CSI-ReportConfig,* *r* ports are indicated in the order of layer ordering for rank *r* and each CSI-RS resource in the CSI resource setting is linked to the *CSI-ReportConfig* based on the order of the associated *NZP-CSI-RS-ResourceId* in the linked CSI resource setting for channel measurement given by higher layer parameter *resourcesForChannelMeasurement*. The configured higher layer parameter *non-PMI-PortIndication* contains a sequence  of port indices, where  are the CSI-RS port indices associated with rank ν and  where is the number of ports in the CSI-RS resource. The UE shall only report RI corresponding to the configured fields of *PortIndexFor8Ranks*.  - if the UE is not configured with higher layer parameter *non-PMI-PortIndication,* the UE assumes, for each CSI-RS resource in the CSI resource setting linked to the *CSI-ReportConfig*, that the CSI-RS port indices  are associated with ranks  where  is the number of ports in the CSI-RS resource.  - When calculating the CQI for a rank, the UE shall use the ports indicated for that rank for the selected CSI-RS resource. The precoder for the indicated ports shall be assumed to be the identity matrix scaled by .  ...  If the UE is configured with a *CSI-ReportConfig* that contains a list of sub-configurations, provided by the higher layer parameter [*csi-ReportSubConfigList]*:  - The UE expects to be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'. If the UE indicates a capability for supporting mixed codebook combination in a slot with [ABC], each sub-configuration can be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'.  - Each sub-configuration can be configured with an antenna port subset using the higher layer bitmap parameter [*port-subsetIndicator*] which contains the bit sequence, where is the MSB and is the LSB, bit corresponds to antenna port 3000+*i*, and is the number of ports *nrofPorts* configured for the CSI-RS resources(s) within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement that corresponds to the *CSI-ReportConfig*. A bit value 0 in [*port-subsetIndicator*] indicates that the corresponding antenna port is disabled for the sub-configuration, whereas bit value 1 indicates that the antenna port is enabled and belongs to the antenna port subset for the sub-configuration. For the derivation of PMI, antenna ports corresponding to all bits with value of 1 in [*port-subsetIndicator*] are mapped to consecutive antenna ports starting at CSI-RS antenna port 3000 in increasing order of the bit position in [*port-subsetIndicator*].  - If a sub-configuration is configured with an antenna port subset, then the sub-configuration can be configured with a [RI restriction parameter] and, if the number of antenna ports of the subset greater than 2, with [*n1-n2* parameter] if the higher layer parameter *codebookType* is set to 'typeI-SinglePanel' or with [*ng*-*n1-n2* parameter] if the higher layer parameter *codebookType* is set to 'typeI-MultiPanel', and, if the corresponding number of antenna ports of the subset is 2, with *twoTX-CodebookSubsetRestriction*, and, if the CSI report configuration configured with the higher layer parameter reportQuantity set to ‘cri-RI-i1-CQI', with typeI-SinglePanel-codebookSubsetRestriction-i2, where the parameters [RI restriction], [*n1-n2],* [*ng*-*n1-n2],* *twoTX-CodebookSubsetRestriction,* typeI-SinglePanel-codebookSubsetRestriction-i2, are as described in Clauses 5.2.2.2.1 and 5.2.2.2.2.  ... |

TP#3 from Fujitsu

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| * **Reason for changes**   Current specification on non-PMI feedback is not applicable for Type1 SD adaptation and corresponding spec impact is need.   * **Summary of changes**   The high layer parameter non-PMI-PortIndication is configured per sub-configuration when type 1 SD adaptation is configured.  The UE assumes the CSI-RS port indices  are associated with ranks  for each sub-configuration where are the CSI-RS port indices associated with rank ν in the sub-configuration and  is the number of ports in each sub-configuration.   * **Consequences if not approved**   Non-PMI feedback cannot be supported for Type1 SD adaptation.  ---------------------------------------------------- Start of the TP for TS38.214-------------------------------------------  **5.2.1.4.2 Report Quantity Configurations**  <Unrelated part omitted>  If the UE is configured with a *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to 'cri-RI-CQI',  - if the UE is configured with higher layer parameter *non-PMI-PortIndication* contained in a *CSI-ReportConfig,* *r* ports are indicated in the order of layer ordering for rank *r* and each CSI-RS resource in the CSI resource setting is linked to the *CSI-ReportConfig* based on the order of the associated *NZP-CSI-RS-ResourceId* in the linked CSI resource setting for channel measurement given by higher layer parameter *resourcesForChannelMeasurement*. The configured higher layer parameter *non-PMI-PortIndication* contains a sequence  of port indices, where  are the CSI-RS port indices associated with rank ν and  where is the number of ports in the CSI-RS resource. The UE shall only report RI corresponding to the configured fields of *PortIndexFor8Ranks*.  - if the UE is not configured with higher layer parameter *non-PMI-PortIndication,* the UE assumes, for each CSI-RS resource in the CSI resource setting linked to the *CSI-ReportConfig*, that the CSI-RS port indices  are associated with ranks  where  is the number of ports in the CSI-RS resource.  - When calculating the CQI for a rank, the UE shall use the ports indicated for that rank for the selected CSI-RS resource. The precoder for the indicated ports shall be assumed to be the identity matrix scaled by .  If the UE is configured with a *CSI-ReportConfig* and with the higher layer parameter *reportQuantity* set to 'cri-RI-CQI', and the *CSI-ReportConfig* contains a list of sub-configurations, provided by the higher layer parameter [*csi-ReportSubConfigList]*, and each sub-configuration is configured with an antenna port subset using the higher layer bitmap parameter [*port-subsetIndicator*],  - If the UE is configured with higher layer parameter *non-PMI-PortIndication* per sub-configuration contained in a *CSI-ReportConfig,* *r* ports are indicated in the order of layer ordering for rank *r* and each sub-configuration associated with each CSI-RS resource in the CSI resource setting is linked to the *CSI-ReportConfig* based on the order of the associated *csi-ReportSubConfigId and NZP-CSI-RS-ResourceId* in the linked CSI resource setting for channel measurement given by higher layer parameter *resourcesForChannelMeasurement*. The configured higher layer parameter *non-PMI-PortIndication* contains a sequence  of port indices, where  are the CSI-RS port indices associated with rank ν and  where is the number of ports for each sub-configuration. The UE shall only report RI corresponding to the configured fields of *PortIndexFor8Ranks*.  - If the UE is configured with higher layer parameter *non-PMI-PortIndication* per sub-configuration contained in a *CSI-ReportConfig* , the UE assumes, for each sub-configuration associated with each CSI-RS resource in the CSI resource setting linked to the *CSI-ReportConfig*, that the CSI-RS port indices  are associated with ranks  where are the CSI-RS port indices associated with rank ν in the sub-configuration and  is the number of ports for the sub-configuration ~~in the CSI-RS resource~~.  - When calculating the CQI for a rank, the UE shall use the ports indicated for that rank for the indicated sub-configuration of the selected CSI-RS resource. The precoder for the indicated ports shall be assumed to be the identity matrix scaled by .  <Unrelated part omitted>  ---------------------------------------------------- End of the TP for TS38.214------------------------------------------   * **Reason for changes**   It is ambiguous that the current description on CSI-RS resources for type 2 SD adaptation in TS38.214   * **Summary of changes**   Add the condition when the list of NZP CSI-RS resources is identical to or has no intersection with other lists for type 2 SD adaptation.  Add the association between the list of NZP CSI-RS resources and the *poweroffset* for joint PD + SD adaptation.   * **Consequences if not approved**   It is ambiguous that the current description on CSI-RS resources for type 2 SD adaptation in TS38.214  ---------------------------------------------------- Start of the TP for TS38.214-------------------------------------------  **5.2.1.4.2 Report Quantity Configurations**  <Unrelated part omitted>  If the UE is configured with a *CSI-ReportConfig* that contains a list of sub-configurations, provided by the higher layer parameter [*csi-ReportSubConfigList]*:  - the UE expects to be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'. If the UE indicates a capability for supporting mixed codebook combination in a slot with [ABC], each sub-configuration can be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'.  - Each sub-configuration can be configured with an antenna port subset using the higher layer bitmap parameter [*port-subsetIndicator*] which contains the bit sequence , where is the MSB and is the LSB, bit corresponds to antenna port , and is the number of ports *nrofPorts* configured for the CSI-RS resources(s) within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement that corresponds to the *CSI-ReportConfig*. A bit value 0 in [*port-subsetIndicator*] indicates that the corresponding antenna port is disabled for the sub-configuration, whereas bit value 1 indicates that the antenna port is enabled and belongs to the antenna port subset for the sub-configuration.  - If a sub-configuration is configured with an antenna port subset, then the sub-configuration can be configured with a [RI restriction parameter] and, if the number of antenna ports of the subset greater than 2, with [*n1-n2* parameter] if the higher layer parameter *codebookType* is set to 'typeI-SinglePanel' or with [*ng*-*n1-n2* parameter] if the higher layer parameter *codebookType* is set to 'typeI-MultiPanel', and, if the corresponding number of antenna ports of the subset is 2, with *twoTX-CodebookSubsetRestriction*, where the parameters [RI restriction], [*n1-n2],* [*ng*-*n1-n2],* *twoTX-CodebookSubsetRestriction* are as described in Clauses 5.2.2.2.1 and 5.2.2.2.2.  - A sub-configuration can be configured with a list of NZP CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*], which indicates one or more NZP CSI-RS resources, within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement which corresponds to the *CSI-ReportConfig.*~~[The list of NZP CSI-RS resources is identical to or has no intersection with a list of NZP CSI-RS resources configured for any other sub-configuration(s) within the~~ *~~CSI-ReportConfig~~*~~.]~~ If there is no subconfigurations configured with a power offset provided by [*powerOffse*t], the list of NZP CSI-RS resources has no intersection with a list of NZP CSI-RS resources configured for any other sub-configuration(s) within the *CSI-ReportConfig.* If there is one or more subconfigurations configured with a power offset provided by [*powerOffse*t], the list of NZP CSI-RS resources is identical or has no intersection with a list of NZP CSI-RS resources configured for any other sub-configuration(s) within the *CSI-ReportConfig.*  - If the list of NZP CSI-RS resources is identical among the sub-configuration(s), the value of [*powerOffse*t] is different among the sub-configuration(s).  - If the list of NZP CSI-RS resources has no intersection among the sub-configuration(s), the value of [*powerOffse*t] is same or different among the sub-configuration(s).  <Unrelated part omitted>  ---------------------------------------------------- End of the TP for TS38.214------------------------------------------ |

TP#4 from Apple

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| **Reason for change:**  Support of 'cri-RI-i1-CQI', 'cri-RI-CQI' requires additional parameters in the sub-configuration or clarification of UE assumptions when these parameters are not configured. |
| **Summary of change:**  Added typeI-SinglePanel-codebookSubsetRestriction-i2, and non-PMI-PortIndication in the sub-configuration and clarified UE assumptions when these parameters are not configured. |
| **Consequences if not approved:**  'cri-RI-i1-CQI', 'cri-RI-CQI' can not be well supported in NES |
| -----------------------------------------------------------Text proposal -----------------------------------------------------------  TS38.214  5.2.1.4.2 Report quantity configurations  <Unchanged parts omitted>  If the UE is configured with a *CSI-ReportConfig* that contains a list of sub-configurations, provided by the higher layer parameter [*csi-ReportSubConfigList]*:  - ...  - If a sub-configuration is configured with an antenna port subset, then the sub-configuration can be configured with a [RI restriction parameter] and, if the number of antenna ports of the subset greater than 2, with [*n1-n2* parameter] if the higher layer parameter *codebookType* is set to 'typeI-SinglePanel' or with [*ng*-*n1-n2* parameter] if the higher layer parameter *codebookType* is set to 'typeI-MultiPanel', and, if the corresponding number of antenna ports of the subset is 2, with *twoTX-CodebookSubsetRestriction*, where the parameters [RI restriction], [*n1-n2],* [*ng*-*n1-n2],* *twoTX-CodebookSubsetRestriction*, *typeI-SinglePanel-ri-Restriction*, *codebookMode* are as described in Clauses 5.2.2.2.1 and 5.2.2.2.2.  - if *reportQuantity* is set as 'cri-RI-i1-CQI', the sub-configuration can be additionally configured with *typeI-SinglePanel-codebookSubsetRestriction-i2*, if not configured in the sub-configuration, UE assumes precoder for CQI calculation is randomly selected.  *-*  if *reportQuantity* is set as 'cri-RI-CQI', the sub-configuration can be additionally configured with *non-PMI-PortIndication,* if not configured in the sub-configuration, UE assumes, for each CSI-RS resource in the CSI resource setting linked to the *CSI-ReportConfig*, that the CSI-RS port indices  are associated with ranks  where  corresponds to the number of bits with value 1 in the bitmap [port-subsetIndicator]  - A sub-configuration can be configured with a list of NZP CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*], which indicates one or more NZP CSI-RS resources, within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement which corresponds to the *CSI-ReportConfig.*  [The list of NZP CSI-RS resources is identical to or has no intersection with a list of NZP CSI-RS resources configured for any other sub-configuration(s) within the *CSI-ReportConfig*.]  - A sub-configuration can be configured with a power offset provided by [*powerOffse*t].  <Unchanged parts omitted>  -------------------------------------------------------End of Text proposal ------------------------------------------------------ |

TP#5 from Samsung for non PMI report

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| **TP for TS 38.214 Clause 5.2.1.4.2 Report Quantity Configurations**  <omitted texts>  If the UE is configured with a *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to 'cri-RI-CQI',  - if the UE is configured with higher layer parameter *non-PMI-PortIndication* contained in a *CSI-ReportConfig,* *r* ports are indicated in the order of layer ordering for rank *r* and each CSI-RS resource in the CSI resource setting is linked to the *CSI-ReportConfig* based on the order of the associated *NZP-CSI-RS-ResourceId* in the linked CSI resource setting for channel measurement given by higher layer parameter *resourcesForChannelMeasurement*. The configured higher layer parameter *non-PMI-PortIndication* contains a sequence  of port indices, where  are the CSI-RS port indices associated with rank ν and  where is the number of ports in the CSI-RS resource. The UE shall only report RI corresponding to the configured fields of *PortIndexFor8Ranks*. If the UE is configured with a *CSI-ReportConfig* that contains a list of sub-configurations, the higher layer parameter *non-PMI-PortIndication* is separately provided for each sub-configuration and *P* corresponds to the number of bits with value 1 in the bitmap [*port-subsetIndicator*] for the corresponding sub-configuration.  - if the UE is not configured with higher layer parameter *non-PMI-PortIndication,* the UE assumes, for each CSI-RS resource in the CSI resource setting linked to the *CSI-ReportConfig*, that the CSI-RS port indices  are associated with ranks  where  is the number of ports in the CSI-RS resource. If the UE is configured with a *CSI-ReportConfig* that contains a list of sub-configurations, *P* corresponds to the number of bits with value 1 in the bitmap [*port-subsetIndicator*] for the corresponding sub-configuration.  - When calculating the CQI for a rank, the UE shall use the ports indicated for that rank for the selected CSI-RS resource. The precoder for the indicated ports shall be assumed to be the identity matrix scaled by .  <omitted texts> |

TP#6 from Samsung for *typeI-SinglePanel-codebookSubsetRestriction-i2* and *codebookMode* for Type 1 SD

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| **TP for TS 38.214 Clause 5.2.1.4.2 Report Quantity Configurations**  <omitted texts>  If the UE is configured with a *CSI-ReportConfig* that contains a list of sub-configurations, provided by the higher layer parameter [*csi-ReportSubConfigList]*:  - the UE expects to be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'. If the UE indicates a capability for supporting mixed codebook combination in a slot with [ABC], each sub-configuration can be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'. - Each sub-configuration can be configured with an antenna port subset using the higher layer bitmap parameter [*port-subsetIndicator*] which contains the bit sequence , where is the MSB and is the LSB, bit corresponds to antenna port , and is the number of ports *nrofPorts* configured for the CSI-RS resources(s) within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement that corresponds to the *CSI-ReportConfig*. A bit value 0 in [*port-subsetIndicator*] indicates that the corresponding antenna port is disabled for the sub-configuration, whereas bit value 1 indicates that the antenna port is enabled and belongs to the antenna port subset for the sub-configuration. For the derivation of PMI, antenna ports corresponding to all bits with value of 1 in [*port-subsetIndicator*] are mapped to consecutive antenna ports starting at CSI-RS antenna port 3000 in increasing order of the bit position in [*port-subsetIndicator*].  - If a sub-configuration is configured with an antenna port subset, then the sub-configuration can be configured with a [RI restriction parameter] and, if the number of antenna ports of the subset greater than 2, with [*n1-n2* parameter] if the higher layer parameter *codebookType* is set to 'typeI-SinglePanel' or with [*ng*-*n1-n2* parameter] if the higher layer parameter *codebookType* is set to 'typeI-MultiPanel', and, if the corresponding number of antenna ports of the subset is 2, with *twoTX-CodebookSubsetRestriction*, where the parameters [RI restriction], [*n1-n2],* [*ng*-*n1-n2],* *twoTX-CodebookSubsetRestriction* are as described in Clauses 5.2.2.2.1 and 5.2.2.2.2.  - If a sub-configuration is configured with an antenna port subset, and if higher layer parameter *reportQuantity* is set to 'cri-RI-i1-CQI', and if the higher layer parameter *codebookType* is set to 'typeI-SinglePanel', and if higher layer parameter *pmi-FormatIndicator* is set to 'widebandPMI', then the sub-configuration can be configured with higher layer parameter *typeI-SinglePanel-codebookSubsetRestriction-i2,* where *twoTX-CodebookSubsetRestriction* are as described in Clause 5.2.2.2.2.  - If a sub-configuration is configured with an antenna port subset, and if the *CSI-ReportConfig* that contains a mix of sub-configuration(s) corresponding to 'typeI-SinglePanel' and sub-configuration(s) corresponding to 'typeI-MultiPanel', then the sub-configuration can be configured with the higher layer parameter *codebookMode*.  - A sub-configuration can be configured with a list of NZP CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*], which indicates one or more NZP CSI-RS resources, within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement which corresponds to the *CSI-ReportConfig.*[The list of NZP CSI-RS resources is identical to or has no intersection with a list of NZP CSI-RS resources configured for any other sub-configuration(s) within the *CSI-ReportConfig*.]  - A sub-configuration can be configured with a power offset provided by [*powerOffse*t].  - If a sub-configurations is not configured with [*nzp-CSI-RS-resourceList*] then the sub-configuration shall be associated with all the NZP CSI-RS resources within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement which corresponds to the *CSI-ReportConfig.*  - the UE reports CSI(s) for one or more sub-configurations according to Clauses 5.2.1.5.1, 5.2.1.5.2, 5.2.3 and 5.2.4, and according to the higher layer parameter *reportQuantity* configured for that *CSI-ReportConfig*.  - The UE does not expect the higher layer parameter reportQuantity to be set to ‘cri-RSRP’, ‘cri-SINR’, or ‘cri-SINR- Index’.  <omitted texts> |

TP#7 from Samsung for *CodebookConfig* for Type 1 SD

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| **TP for TS 38.214 Clause 5.2.1.4.2 Report Quantity Configurations**  <omitted texts>  If the UE is configured with a *CSI-ReportConfig* that contains a list of sub-configurations, provided by the higher layer parameter [*csi-ReportSubConfigList]*:  - the UE expects to be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'. If the UE indicates a capability for supporting mixed codebook combination in a slot with [ABC], each sub-configuration can be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'. - Each sub-configuration can be configured with an antenna port subset using the higher layer bitmap parameter [*port-subsetIndicator*] which contains the bit sequence , where is the MSB and is the LSB, bit corresponds to antenna port , and is the number of ports *nrofPorts* configured for the CSI-RS resources(s) within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement that corresponds to the *CSI-ReportConfig*. A bit value 0 in [*port-subsetIndicator*] indicates that the corresponding antenna port is disabled for the sub-configuration, whereas bit value 1 indicates that the antenna port is enabled and belongs to the antenna port subset for the sub-configuration. For the derivation of PMI, antenna ports corresponding to all bits with value of 1 in [*port-subsetIndicator*] are mapped to consecutive antenna ports starting at CSI-RS antenna port 3000 in increasing order of the bit position in [*port-subsetIndicator*].  - If a sub-configuration is configured with an antenna port subset, then the sub-configuration can be configured with a [RI restriction parameter] and, if the number of antenna ports of the subset greater than 2, with [*n1-n2* parameter] if the higher layer parameter *codebookType* is set to 'typeI-SinglePanel' or with [*ng*-*n1-n2* parameter] if the higher layer parameter *codebookType* is set to 'typeI-MultiPanel', and, if the corresponding number of antenna ports of the subset is 2, with *twoTX-CodebookSubsetRestriction*, where the parameters [RI restriction], [*n1-n2],* [*ng*-*n1-n2],* *twoTX-CodebookSubsetRestriction* are as described in Clauses 5.2.2.2.1 and 5.2.2.2.2.  - A sub-configuration can be configured with a list of NZP CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*], which indicates one or more NZP CSI-RS resources, within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement which corresponds to the *CSI-ReportConfig.*[The list of NZP CSI-RS resources is identical to or has no intersection with a list of NZP CSI-RS resources configured for any other sub-configuration(s) within the *CSI-ReportConfig*.]  - A sub-configuration can be configured with a power offset provided by [*powerOffse*t].  - If a sub-configurations is not configured with [*nzp-CSI-RS-resourceList*] then the sub-configuration shall be associated with all the NZP CSI-RS resources within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement which corresponds to the *CSI-ReportConfig.*  - the UE reports CSI(s) for one or more sub-configurations according to Clauses 5.2.1.5.1, 5.2.1.5.2, 5.2.3 and 5.2.4, and according to the higher layer parameter *reportQuantity* configured for that *CSI-ReportConfig*.  - the UE reports CSI for a sub-configuration according to the parameters configured in the *CodebookConfig* provided in the sub-configuration when present; otherwise, if a parameter is present in the *CodebookConfig* provided in the *CSI-ReportConfig* but not in the *CodebookConfig* provided in the sub-configuration, the parameter configured in the *CodebookConfig* provided in the *CSI-ReportConfig* is used.  - The UE does not expect the higher layer parameter reportQuantity to be set to ‘cri-RSRP’, ‘cri-SINR’, or ‘cri-SINR- Index’.  <omitted texts> |

TP#8 from LGe for non PMI report (as well as port re-indexing for CQI)

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| **Reason for Change:**   * If a UE is configured with a *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to 'cri-RI-CQI' and if a sub-configuration contained in the *CSI-ReportConfig* is configured with *port-subsetIndicator*, how to interpret a sequence of port indices corresponding to a rank *r* is unclear since some of CSI-RS antenna ports can be muted by the higher layer parameter *port-subsetIndicator* for the sub-configuration.   **Summary of Change:**   * If a UE is configured with a *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to 'cri-RI-CQI' and if at least one sub-configuration contained in the *CSI-ReportConfig* is configured with *port-subsetIndicator*,   + If the UE is configured with higher layer parameter *non-PMI-PortIndication* in a sub-configuration, *non-PMI-PortIndication* configures a sequence of CSI-RS port indices corresponding to rank values from 1 to the number of bits with value 1 in port-subsetIndicator.   + Otherwise, the UE assumes that *r* CSI-RS port index(es) corresponding to a rank *r* is(are) determined in the ascending order of port indices starting from the lowest index.   + A sequence of port indices for all cases above is interpreted by re-indexing antenna ports corresponding to all bits with value of 1 in *port-subsetIndicator* as consecutive antenna ports starting at CSI-RS antenna port 3000 in increasing order of the bit position in *port-subsetIndicator*.   **Consequences if not approved:**   * Unclear UE behavior to perform CSI report corresponding to a CSI report configuration containing a list of sub-configurations if at least one sub-configuration is configured with *port-subsetIndicator* and the higher layer parameter *reportQuantity* set to 'cri-RI-CQI'.   5.2.1.4.2 Report quantity configurations  <Unchanged texts omitted>  If the UE is configured with a *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to 'cri-RI-CQI',  - If the *CSI-ReportConfig* contains a list of sub-configurations, provided by the higher layer parameter [*csi-ReportSubConfigList]*, and if at least one sub-configuration is configured with a CSI-RS antenna port subset, provided by [*port-subsetIndicator*],  - if the UE is configured with higher layer parameter *non-PMI-PortIndication* contained in a sub-configuration*,* *r* ports are indicated in the order of layer ordering for rank *r* and each CSI-RS resource in the CSI resource setting is linked to the *CSI-ReportConfig* based on the order of the associated *NZP-CSI-RS-ResourceId* in the linked CSI resource setting for channel measurement given by higher layer parameter *resourcesForChannelMeasurement*. The configured higher layer parameter *non-PMI-PortIndication* contains a sequence  of port indices, where  are the CSI-RS port indices associated with rank ν and  where is the number of ports in the CSI-RS resource or the number of bits with value 1 in the bitmap [*port-subsetIndicator*] if provided in the sub-configuration. The UE shall only report RI corresponding to the configured fields of *PortIndexFor8Ranks*.  - if the UE is not configured with higher layer parameter *non-PMI-PortIndication* contained in a sub-configuration*,* the UE assumes, for each CSI-RS resource in the CSI resource setting linked to the *CSI-ReportConfig*, that the CSI-RS port indices  are associated with ranks  where  is the number of ports in the CSI-RS resource or the number of bits with value 1 in the bitmap [*port-subsetIndicator*] if provided in the sub-configuration.  - In all cases above, for the sub-configuration provided with [*port-subsetIndicator*], the CSI-RS port indices are derived by mapping antenna ports corresponding to all bits with value of 1 in [*port-subsetIndicator*] as consecutive antenna ports starting at CSI-RS antenna port 3000 in increasing order of the bit position in [*port-subsetIndicator*].  - otherwise,  - if the UE is configured with higher layer parameter *non-PMI-PortIndication* contained in a *CSI-ReportConfig,* *r* ports are indicated in the order of layer ordering for rank *r* and each CSI-RS resource in the CSI resource setting is linked to the *CSI-ReportConfig* based on the order of the associated *NZP-CSI-RS-ResourceId* in the linked CSI resource setting for channel measurement given by higher layer parameter *resourcesForChannelMeasurement*. The configured higher layer parameter *non-PMI-PortIndication* contains a sequence  of port indices, where  are the CSI-RS port indices associated with rank ν and  where is the number of ports in the CSI-RS resource. The UE shall only report RI corresponding to the configured fields of *PortIndexFor8Ranks*.  - if the UE is not configured with higher layer parameter *non-PMI-PortIndication,* the UE assumes, for each CSI-RS resource in the CSI resource setting linked to the *CSI-ReportConfig*, that the CSI-RS port indices  are associated with ranks  where  is the number of ports in the CSI-RS resource.  - When calculating the CQI for a rank, the UE shall use the ports indicated for that rank for the selected CSI-RS resource. The precoder for the indicated ports shall be assumed to be the identity matrix scaled by . |

TP#9 from LGe for Type 2 SD (/and PD)

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| **Reason for Change:**   * The restriction on configuring a list of NZP CSI-RS resource IDs for type 2 SD or type 2 SD + PD adaptation is not specified.   **Summary of Change:**   * For type 2 SD adaptation, the NZP CSI-RS resource list configured for a sub-configuration has no intersection with the resource list configured for another sub-configuration within the same CSI report configuration. * For type 2 SD + PD adaptation, the NZP CSI-RS resource list configured for a sub-configuration is identical to or has no intersection with the resource list configured for another sub-configuration within the same CSI report configuration.   **Consequences if not approved:**   * Arbitrary configuration for a list of NZP CSI-RS resource IDs for type 2 SD or type 2 SD + PD adaptation is allowed, which is not aligned with previous RAN1 agreement.   5.2.1.4.2 Report quantity configurations  <Unchanged texts omitted>  If the UE is configured with a *CSI-ReportConfig* that contains a list of sub-configurations, provided by the higher layer parameter [*csi-ReportSubConfigList]*:  - The UE expects to be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'. If the UE indicates a capability for supporting mixed codebook combination in a slot with [ABC], each sub-configuration can be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'.  - Each sub-configuration can be configured with an antenna port subset using the higher layer bitmap parameter [*port-subsetIndicator*] which contains the bit sequence , where is the MSB and is the LSB, bit corresponds to antenna port , and is the number of ports *nrofPorts* configured for the CSI-RS resources(s) within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement that corresponds to the *CSI-ReportConfig*. A bit value 0 in [*port-subsetIndicator*] indicates that the corresponding antenna port is disabled for the sub-configuration, whereas bit value 1 indicates that the antenna port is enabled and belongs to the antenna port subset for the sub-configuration. For the derivation of PMI, antenna ports corresponding to all bits with value of 1 in [*port-subsetIndicator*] are mapped to consecutive antenna ports starting at CSI-RS antenna port 3000 in increasing order of the bit position in [*port-subsetIndicator*].  - If a sub-configuration is configured with an antenna port subset, then the sub-configuration can be configured with a [RI restriction parameter] and, if the number of antenna ports of the subset greater than 2, with [*n1-n2* parameter] if the higher layer parameter *codebookType* is set to 'typeI-SinglePanel' or with [*ng*-*n1-n2* parameter] if the higher layer parameter *codebookType* is set to 'typeI-MultiPanel', and, if the corresponding number of antenna ports of the subset is 2, with *twoTX-CodebookSubsetRestriction*, where the parameters [RI restriction], [*n1-n2],* [*ng*-*n1-n2],* *twoTX-CodebookSubsetRestriction* are as described in Clauses 5.2.2.2.1 and 5.2.2.2.2.  - A sub-configuration can be configured with a list of NZP CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*], which indicates one or more NZP CSI-RS resources, within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement which corresponds to the *CSI-ReportConfig.* The list of NZP CSI-RS resources has no intersection with a list of NZP CSI-RS resources configured for any other sub-configuration(s) within the *CSI-ReportConfig*, except when at least one of sub-configurations within the *CSI-ReportConfig* is configured with a power offset provided by [*powerOffset*] in which case the list of NZP CSI-RS resources is identical to or has no intersection with a list of NZP CSI-RS resources configured for any other sub-configuration(s) within the *CSI-ReportConfig*.  - A sub-configuration can be configured with a power offset provided by [*powerOffse*t].  - If a sub-configurations is not configured with [*nzp-CSI-RS-resourceList*] then the sub-configuration shall be associated with all the NZP CSI-RS resources within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement which corresponds to the *CSI-ReportConfig.*  - the UE reports CSI(s) for one or more sub-configurations according to Clauses 5.2.1.5.1, 5.2.1.5.2, 5.2.3 and 5.2.4, and according to the higher layer parameter *reportQuantity* configured for that *CSI-ReportConfig*.  - The UE does not expect the higher layer parameter *reportQuantity* to be set to ‘cri-RSRP’, ‘cri-SINR’, or ‘cri-SINR- Index'. |

TP#10 from Ericsson for Type 2 SD

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| * Reason for changes   + Resolution of square brackets in 38.214 Section 5.2.1.4.2 for how a list of CSI-RS resources in a sub-configuration can be configured for Type-2 SD with or without joint PD adaptation * Summary of changes   + Clarify restrictions on the configuration of the list of CSI-RS resources in a sub-configuration covering Type-2 SD with or without joint PD adaptation. The restriction * Consequences if not approved   + Incomplete specification for Type-2 SD with or without joint PD adaptation   -------------------------------- Text Proposal (TP#3) for 38.xxx, Section x.y.z -----------------------------------  5.2.1.4.2 Report quantity configurations  \*\*\* Unchanged text omitted \*\*\*  - A sub-configuration can be configured with a list of NZP CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*], which indicates one or more NZP CSI-RS resources, within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement which corresponds to the *CSI-ReportConfig.*  ~~[The list of NZP CSI-RS resources is identical to or has no intersection with a list of NZP CSI-RS resources configured for any other sub-configuration(s) within the~~ *~~CSI-ReportConfig~~*~~.]~~  - A sub-configuration can be configured with a power offset provided by [*powerOffse*t].  - For any pair of sub-configurations each configured with a list of NZP CSI-RS resources provided by [*nzp-CSI-RS-resourceList*], the lists either have no intersection or are identical. If identical, either one or both sub-configurations are configured with a power offset provided by [*powerOffse*t], and the power offset shall be non-zero if only one sub-configuration is configured with a power offset, and the power offsets shall be different if both sub-configuration are configured with a power offset.  \*\*\* Unchanged text omitted \*\*\*  ----------------------------------------------------------- End Text Proposal ---------------------------------------------------------- |

**Issue 4**

TP#1 from Huawei, HiSilicon

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| **Reason for change:**  For active CSI-RS resource/port counting, the value of X in the agreement need to be specified.  **Summary of change:**  X in TS 38.214 is clarified to equal N the number of triggered sub-configurations for AP/SP CSI report configuration or equal L the number of configured sub-configurations for P CSI report configuration.  **Consequence if not approved:**  The number of active CSI-RS resource/port for a CSI report configuration containing sub-configuration(s) indicated in a *CSI-ReportConfig* is unclear.  ---------------------------- Start of Text Proposal 4 for TS 38.214 --------------------------  < Unchanged parts are omitted >  **5.2.1.6 CSI processing criteria**  < Unchanged parts are omitted >  For a CSI report configuration containing sub-configuration(s) indicated in a *CSI-ReportConfig,* if a CSI-RS resource is referred by *M* sub-configurations among *~~X~~* *N* indicated sub-configurations of AP/SP CSI report configuration or *L* configured sub-configurations of P CSI report configuration, the CSI-RS resource is counted *M* times and the CSI-RS ports within the CSI-RS resource are counted as follows:  - if each sub-configuration, of the *M* sub-configurations, is configured with a CSI-RS antenna port subset, provided by [*port-subsetIndicator*],  - *M* × *P* if each sub-configuration, of the *M* sub-configurations, is configured with a list of one or more CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*], [and/] or is configured with a power offset, provided by *[powerOffset]*,  Where *P* is the number of ports configured by *nrofPorts* and is the number of CSI-RS ports in sub-configuration *s* derived from the corresponding antenna port subset indicator [*port-subsetIndicator*] according to clause 5.2.1.4.2.  < Unchanged parts are omitted >  --------------------------------------- End of Text Proposal -------------------------------- |

TP#2 from Fujitsu

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| * **Reason for changes**   According to the current NR specification, active resource/port counting is based on the RRC signaling to configure P-CSI-RS resources or the MAC-CE to activate SP-CSI-RS resources.   * For a SP-CSI-RS resource, it becomes active from the end of the activation command is applied, and ending at the end of the deactivation command is applied. * For a P-CSI-RS resource, it becomes active when the P-CSI-RS is configured by RRC signaling, and ending when the P-CSI-RS configuration is released.   For A or SP CSI report, it is most likely that the CSI report is not triggered or activated when the associated P or SP CSI-RS resource(s) become active. Therefore, it is reasonable for resource/port counting to depend on *L* sub-configurations.   * **Summary of changes**   Clarify value of X such that CSI-RS resource/port counting depends on N triggered sub-configurations for A-CSI-RS resources and L configured sub-configurations for P-CSI-RS / SP-CSI-RS resources.   * **Consequences if not approved**   The result of CSI-RS resource/port counting for CSI report configuration containing sub-configurations is not clear.  ---------------------------------------------------- Start of the TP for TS38.214-------------------------------------------  **5.2.1.6 CSI processing criteria**  <Unrelated part omitted>  For a CSI report configuration containing sub-configuration(s) indicated in a *CSI-ReportConfig,* if an aperiodic CSI-RS resource is referred by *M* triggered sub-configurations or if a periodic or semi-persistent CSI-RS resource is referred by *M* configured sub-configurations, the CSI-RS resource is counted M times and the CSI-RS ports within the CSI-RS resource are counted as follows:  - if each sub-configuration, of the *M* sub-configurations, is configured with a CSI-RS antenna port subset, provided by [*port-subsetIndicator*],  - *M* × *P* if each sub-configuration, of the *M* sub-configurations, is configured with a list of one or more CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*], [and/] or is configured with a power offset, provided by *[powerOffset]*,  Where *P* is the number of ports configured by *nrofPorts* and is the number of CSI-RS ports in sub-configuration *s* derived from the corresponding antenna port subset indicator [*port-subsetIndicator*] according to clause 5.2.1.4.2.  <Unrelated part omitted>  ---------------------------------------------------- End of the TP for TS38.214------------------------------------------ |

TP#3 from CATT

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| **5.2.1.6 CSI processing criteria** ---------------------------------------------------- Unchanged text is omitted ---------------------------------------------------------  For a CSI report configuration containing sub-configuration(s) indicated in a *CSI-ReportConfig,* if a CSI-RS resource is referred by *M* sub-configurations among *~~X~~**N* triggered sub-configurations corresponding to aperiodic CSI-RS resource/ semi-persistent CSI-RS resource or L configured sub-configurations corresponding to periodic CSI-RS resource, the CSI-RS resource is counted *M* times and the CSI-RS ports within the CSI-RS resource are counted as follows:  - if each sub-configuration, of the *M* sub-configurations, is configured with a CSI-RS antenna port subset, provided by [*port-subsetIndicator*],  - *M* × *P* if each sub-configuration, of the *M* sub-configurations, is configured with a list of one or more CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*], [and/] or is configured with a power offset, provided by *[powerOffset]*,  Where *P* is the number of ports configured by *nrofPorts* and is the number of CSI-RS ports in sub-configuration *s* derived from the corresponding antenna port subset indicator [*port-subsetIndicator*] according to clause 5.2.1.4.2.  ---------------------------------------------------- Unchanged text is omitted --------------------------------------------------------- |

TP#4 from Apple

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| **Reason for change:** The definition of X sub-configuration is not clear. |
| **Summary of change:** Clarified the definition of X sub-configurations. |
| **Consequences if not approved:** Unclear spec. |
| -----------------------------------------------------------Text proposal -----------------------------------------------------------  TS38.214  5.2.1.6 CSI processing criteria  <Unchanged parts omitted>  For a CSI report configuration containing sub-configuration(s) indicated in a *CSI-ReportConfig,* if a CSI-RS resource is referred by *M* sub-configurations among *X* sub-configurations, the CSI-RS resource is counted *M* times and the CSI-RS ports within the CSI-RS resource are counted as follows:  - if each sub-configuration, of the *M* sub-configurations, is configured with a CSI-RS antenna port subset, provided by [*port-subsetIndicator*],  - *M* × *P* if each sub-configuration, of the *M* sub-configurations, is configured with a list of one or more CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*], [and/] or is configured with a power offset, provided by *[powerOffset]*,  Where *P* is the number of ports configured by *nrofPorts* and is the number of CSI-RS ports in sub-configuration*s* derived from the corresponding antenna port subset indicator [*port-subsetIndicator*] according to clause 5.2.1.4.2.  For periodic and semi-persistent CSI-RS, X sub-configurations correspond to all the configured sub-configurations in the *CSI-ReportConfig*, for aperiodic CSI-RS, X sub-configurations correspond to the activated sub-configurations in the *CSI-ReportConfig.*  <Unchanged parts omitted>  -------------------------------------------------------End of Text proposal ------------------------------------------------------ |

TP#5 from LGe

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| **Reason for Change:**   * The definition of X configurations for CSI-RS resource/port counting is not specified. * CSI-RS resource/port counting rule for NES does not cover the joint operation of type 1 SD and PD adaptations.   **Summary of Change:**   * It is clarified that X=N for aperiodic CSI-RS resource and X=L for semi-persistent and periodic CSI-RS resource where N is the number of sub-configurations triggered by UL grant and L is the number of sub-configurations configured for a CSI report configuration. * For the joint operation of type 1 SD and PD adaptation, the number of CSI-RS ports in a sub-configuration is determined by the number of ports configured by *nrofPorts* if the sub-configurations is not configured with *port-subsetIndicator*.   **Consequences if not approved:**   * CSI-RS resource/port counting rule is unclear for CSI-RS resource configured for a CSI report configuration containing a list of sub-configurations   5.2.1.6 CSI processing criteria  <Omitted text>  If a CSI-RS resource is referred *N* times by one or more CSI Reporting Settings, the CSI-RS resource and the CSI-RS ports within the CSI-RS resource are counted *N* times.  For a CSI-RS Resource Set for channel measurement configured with two Resource Groups and Resource Pairs, if a CSI-RS resource is referred times by one of the CSI-RS resources, where is defined in clause 5.2.1.4.2, and/or one or two Resource Pairs, the CSI-RS resource and the CSI-RS ports within the CSI-RS resource are counted times.  For a CSI report configuration containing sub-configuration(s) indicated in a *CSI-ReportConfig,* if a CSI-RS resource is referred by *M* sub-configurations among sub-configurations that are triggered for aperiodic CSI-RS resource or configured in the CSI report configuration for semi-persistent CSI-RS resource or periodic CSI-RS resource, the CSI-RS resource is counted *M* times and the CSI-RS ports within the CSI-RS resource are counted as follows:  -  if at least one sub-configuration, of the *M* sub-configurations, is configured with a CSI-RS antenna port subset, provided by [*port-subsetIndicator*],  - *M* × *P* if each sub-configuration, of the *M* sub-configurations, is configured with a list of one or more CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*], and/or is configured with a power offset, provided by *[powerOffset]*,  Where *P* is the number of ports configured by *nrofPorts* and is the number of CSI-RS ports in sub-configuration *s* derived from the corresponding antenna port subset indicator [*port-subsetIndicator*] according to clause 5.2.1.4.2 if [*port-subsetIndicator*] is provided, otherwise, . |

TP#6 from QC

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| 5.2.1.6 CSI processing criteria  <omitted text>  For a CSI report configuration containing sub-configuration(s) indicated in a *CSI-ReportConfig,* if a CSI-RS resource is referred by *M* sub-configurations among *X* sub-configurations that are triggered for CSI reporting for aperiodic CSI-RS resource or configured in CSI report config for semi-persistent CSI-RS resource or periodic CSI-RS resource, the CSI-RS resource is counted *M* times and the CSI-RS ports within the CSI-RS resource are counted as follows:  - if each sub-configuration, of the *M* sub-configurations, is configured with a CSI-RS antenna port subset, provided by [*port-subsetIndicator*],  - *M* × *P* if each sub-configuration, of the *M* sub-configurations, is configured with a list of one or more CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*], [and/] or is configured with a power offset, provided by *[powerOffset]*,  Where *P* is the number of ports configured by *nrofPorts* and is the number of CSI-RS ports in sub-configuration *s* derived from the corresponding antenna port subset indicator [*port-subsetIndicator*] according to clause 5.2.1.4.2.  <omitted text> |

**Issue 5**

TP#1 from ZTE

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| Reason for changes:   * The definition of X is missing in specification. * The case of joint spatial and power domain adaptation is not considered.   The definition of Ps is incorrect if X=N for aperiodic CSI-RS resource is agreed. |
| Summary of changes:   * Clarify the definition of X, Ps.   Clarify active CSI-RS resource/port counting method for joint adaptation. |
| Consequences if not approved  The counting of active CSI-RS resources/ports for NES is unclear. |
| ----------------------------- Text Proposal (TP#1) for TS 38.214, Subclause 5.2.1.6 --------------------------- 5.2.1.6 CSI processing criteria <omitted text>  For a CSI report configuration containing sub-configuration(s) indicated in a *CSI-ReportConfig,* if a CSI-RS resource is referred by *M* sub-configurations among *X* sub-configurations, where X is the number of triggered sub-configurations for aperiodic CSI-RS resource; X is the number of sub-configurations in the CSI report configuration for semi-persistent CSI-RS resource or periodic CSI-RS resource, the CSI-RS resource is counted *M* times and the CSI-RS ports within the CSI-RS resource are counted as follows:  - if ~~each~~ at least one sub-configuration, of the *M* sub-configurations, is configured with a CSI-RS antenna port subset, provided by [*port-subsetIndicator*],  - *M* × *P* if ~~each~~ at least one sub-configuration, of the *M* sub-configurations, is configured with a list of one or more CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*], ~~[and/]~~ or if each sub-configuration, of the *M* sub-configurations, is configured with a power offset, provided by *[powerOffset]*,  Where *P* is the number of ports configured by *nrofPorts*, if the s-th sub-configuration configured with antenna port subset indicator, is the number of CSI-RS ports in s-th sub-configuration *~~s~~* from *M* sub-configurations derived from the corresponding antenna port subset indicator [*port-subsetIndicator*] according to clause 5.2.1.4.2; otherwise, *Ps=P*.  <omitted text> |

TP#2 from vivo

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| * Reason for changes   + Further clarify the understanding of X.   + Take the following case into consideration when counting active antenna ports.     - A sub-configuration is configured with both Type I SD and PD * Summary of changes   + Reducing unnecessary formula.   + Adding the interpretations of in different types of sub-configs. * Consequences if not approved   + Unclear understanding of X.   + No specs can be used for the active ports counting when sub-configurations are configured with joint PD and Type I SD. * Text proposal for resource and ports counting in the framework of multi-CSI is shown in the following.  |  | | --- | | **TS 38.214 V18.0.0**  5.2.1.6 CSI processing criteria  \*\*\* Unchanged text is omitted \*\*\*  For a CSI report configuration containing sub-configuration(s) indicated in a *CSI-ReportConfig,* if a CSI-RS resource is referred by *M* sub-configurations among *~~X~~* the triggered sub-configurations when the CSI-RS resource is aperiodic CSI-RS or all the configured sub-configurations when the CSI-RS resource is periodic CSI-RS or semi-persistent CSI-RS, the CSI-RS resource is counted *M* times and the CSI-RS ports within the CSI-RS resource are counted as follows:  ~~-~~  ~~if each sub-configuration, of the~~ *~~M~~* ~~sub-configurations, is configured with a CSI-RS antenna port subset, provided by [~~*~~port-subsetIndicator~~*~~], or is configured with a list of one or more CSI-RS resources, provided by [nzp-CSI-RS-resourceList], or is configured with a power offset, provided by [powerOffset],~~  ~~-~~ *~~M~~* ~~×~~ *~~P~~* ~~if each sub-configuration, of the~~ *~~M~~* ~~sub-configurations, is configured with a list of one or more CSI-RS resources, provided by [~~*~~nzp-CSI-RS-resourceList~~*~~], [and/] or is configured with a power offset, provided by~~ *~~[powerOffset]~~*~~,~~  Where *P* is the number of ports configured by *nrofPorts*, and is the number of CSI-RS ports in sub-configuration *s* derived from the corresponding antenna port subset indicator [*port-subsetIndicator*] if configured, otherwise equals to *P* according to clause 5.2.1.4.2.  \*\*\* Unchanged text is omitted \*\*\* | |

TP#3 from CATT

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| **5.2.1.6 CSI processing criteria** ---------------------------------------------------- Unchanged text is omitted ---------------------------------------------------------  For a CSI report configuration containing sub-configuration(s) indicated in a *CSI-ReportConfig,* if a CSI-RS resource is referred by *M* sub-configurations among *X* sub-configurations, the CSI-RS resource is counted *M* times and the CSI-RS ports within the CSI-RS resource are counted as follows:  - if each sub-configuration, of the *M* sub-configurations, is configured with a CSI-RS antenna port subset, provided by [*port-subsetIndicator*],  - *M* × *P* if each sub-configuration, of the *M* sub-configurations, is configured with a list of one or more CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*], ~~[and/]~~ or is configured with a power offset, provided by *[powerOffset]*, but not a CSI-RS antenna port subset.  Where *P* is the number of ports configured by *nrofPorts* and is the number of CSI-RS ports in sub-configuration *s* derived from the corresponding antenna port subset indicator [*port-subsetIndicator*] according to clause 5.2.1.4.2.  ---------------------------------------------------- Unchanged text is omitted -------------------------------------------------------- |

TP#4 from Ericsson

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| * Reason for changes   + The specification for counting of active CSI-RS resources/ports is incomplete for the case of a *CSI-ReportConfig* configured with sub-configurations. The current spec provides resource/port counts for when a CSI-RS resource is referred by *M* sub-configurations among *X* sub-configurations; however, X is currently undefined.   + The specification for counting of active CSI-RS ports is incomplete when one or more sub-configurations is configured for both PD and SD adaptation * Summary of changes   + Provide definition of M (and remove X) for the case of ap/sp/p CSI reporting   + Provide a formula for counting active CSI-RS ports for the case when one or more sub-configurations are configured for both PD and SD adaptation * Consequences if not approved   + Undefined count of active CSI-RS resources/ports for comparison with UE capability on simultaneous resources/ports per CC   ----------------------------------------- Text Proposal (TP#1) for 38.214, Section 5.2.1.6 -----------------------------------  \*\*\* Unchanged text omitted \*\*\*  In any slot, the UE is not expected to have more active CSI-RS ports or active CSI-RS resources in active BWPs than reported as capability. NZP CSI-RS resource is active in a duration of time defined as follows. For aperiodic CSI-RS, starting from the end of the PDCCH containing the request and ending at the end of the scheduled PUSCH containing the report associated with this aperiodic CSI-RS. When the PDCCH candidates are associated with a search space set configured with *searchSpaceLinking*, for the purpose of determining the NZP CSI-RS resource active duration, the PDCCH candidate that ends later in time among the two linked PDCCH candidates is used. For semi-persistent CSI-RS, starting from the end of when the activation command is applied, and ending at the end of when the deactivation command is applied. For periodic CSI-RS, starting when the periodic CSI-RS is configured by higher layer signalling, and ending when the periodic CSI-RS configuration is released. If a CSI-RS resource is referred *N* times by one or more CSI Reporting Settings not configured with higher layer parameter [*csi-ReportSubConfigList*], the CSI-RS resource and the CSI-RS ports within the CSI-RS resource are counted *N* times. For a CSI-RS Resource Set for channel measurement configured with two Resource Groups and Resource Pairs, if a CSI-RS resource is referred times by one of the CSI-RS resources, where is defined in clause 5.2.1.4.2, and/or one or two Resource Pairs, the CSI-RS resource and the CSI-RS ports within the CSI-RS resource are counted times.  For a ~~CSI report configuration~~ *CSI-ReportConfig* containing a list of *L* sub-configuration(s) ~~indicated in a~~ *~~CSI-ReportConfig~~* provided by higher layer parameter [*csi-ReportSubConfigList*]*,* if a CSI-RS resource is referred by *M* sub-configurations ~~among~~ *~~X~~* ~~sub-configurations~~, the CSI-RS resource is counted *M* times and the CSI-RS ports within the CSI-RS resource are counted as follows:  - if each sub-configuration, of the *M* sub-configurations, is configured with a CSI-RS antenna port subset, provided by [*port-subsetIndicator*],  - if one or more sub-configurations are configured with a CSI-RS antenna port subset, provided by [*port-subsetIndicator*], and one or more sub-configurations are configured with a power offset, provided *[powerOffset]*. is the subset of *M* sub-configurations configured with both a CSI-RS antenna port subset and a power offset, and is the subset of *M* sub-configurations configured with a power offset and not configured with a CSI-RS antenna port subset,  - *M* × *P* if each sub-configuration, of the *M* sub-configurations, is configured with a list of one or more CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*], ~~[~~and/~~]~~or is configured with a power offset, provided by *[powerOffset]*,  where is defined as the number of triggered/activated sub-configurations for aperiodic/semi-persistent CSI reporting, and is defined as the number of configured sub-configurations for periodic CSI reporting. ~~Where~~ *P* is the number of ports configured by *nrofPorts* and is the number of CSI-RS ports in sub-configuration *s* derived from the corresponding antenna port subset indicator [*port-subsetIndicator*] according to clause 5.2.1.4.2.  \*\*\* Unchanged text omitted \*\*\*  ----------------------------------------------------------- End Text Proposal ---------------------------------------------------------- |

**Issue 6**

TP#1 from Huawei, HiSilicon for Part 2 wideband CSI

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| **Summary of change:**  For a CSI reporting contains N CSI sub-reporting(s), part 2 CSI(s) of N CSI sub-reporting(s) are omitted at the same time.  **Consequence if not approved:**  If the change is not approved, for a CSI reporting contains N CSI sub-reporting(s), the omission rule of part 2 CSI(s) of N CSI sub-reporting(s) is not clear.  ---------------------------- Start of Text Proposal 5 for TS 38.214 -----------------------------  < Unchanged parts are omitted >  When CSI reporting on PUSCH comprises two parts, the UE may omit a portion of the Part 2 CSI. Omission of Part 2 CSI is according to the priority order shown in Table 5.2.3-1, where  is the number of CSI reports configured to be carried on the PUSCH. Priority 0 is the highest priority and priority  is the lowest priority and the CSI report n corresponds to the CSI report with the nth smallest Prii,CSI(y,k,c,s) value among the  CSI reports as defined in Clause 5.2.5. The subbands for a given CSI report n indicated by the higher layer parameter csi-ReportingBand with value '1' are numbered continuously in increasing order with the lowest subband of csi-ReportingBand with value set to '1' as subband 0. When omitting Part 2 CSI information for a particular priority level, the UE shall omit all of the information at that priority level, except when the corresponding CSI report contains multiple Part 2 CSIs each of which corresponding to a sub-configuration from a list of sub-configurations contained in the CSI-ReportConfig as described in Clause 5.2.1.1.  < Unchanged parts are omitted >  - For a Reporting Setting for which the *CSI-ReportConfig* contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], for a corresponding CSI report which contains one or more CSIs, omission of Part 2 CSI excepting part 2 wideband CSI is done at a sub-configuration level within the same priority level defined by Table 5.2.3-1 where a sub-configuration with an index, provided by [*csi-ReportSubConfigID*], with lower value has higher priority.  < Unchanged parts are omitted >  --------------------------------------- End of Text Proposal ---------------------------------- |

TP#2 from ZTE for Part 2 wideband CSI

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| Reason for changes:   * The dropping rules of Part 2 wideband CSI is unclear. |
| Summary of changes:   * Part 2 widebands in all CSI reports have the same priority and are dropped simultaneously. |
| Consequences if not approved   * The dropping rules of Part 2 wideband CSI is unclear. |
| ----------------------------- Text Proposal (TP#3) for TS38.214, Subclause 5.2.3 --------------------------- 5.2.3 CSI reporting using PUSCH <omitted text>  When CSI reporting on PUSCH comprises two parts, the UE may omit a portion of the Part 2 CSI. Omission of Part 2 CSI is according to the priority order shown in Table 5.2.3-1, where  is the number of CSI reports configured to be carried on the PUSCH. Priority 0 is the highest priority and priority  is the lowest priority and the CSI report *n* corresponds to the CSI report with the *n*th smallest Prii,CSI(*y,k,c,s*) value among the  CSI reports as defined in Clause 5.2.5. The subbands for a given CSI report *n* indicated by the higher layer parameter *csi-ReportingBand* with value '1' are numbered continuously in increasing order with the lowest subband of *csi-ReportingBand* with value set to '1' as subband 0. When omitting Part 2 CSI information for a particular priority level, the UE shall omit all of the information at that priority level, except priority level is not priority 0 and ~~when~~ the corresponding CSI report contains multiple Part 2 CSIs each of which corresponding to a sub-configuration from a list of sub-configurations contained in the *CSI-ReportConfig* as described in Clause 5.2.1.1.  <omitted text> |
| Reason for changes:   * Current TS 38.213 does not capture dropping rules of Part 2 CSI sub-reports. |
| Summary of changes:   * CSI sub-reports are considered as CSI reports in Clause 9.2.5. |
| Consequences if not approved   * The dropping rule of Part 2 CSI sub-reports in TS 38.213 and TS 38.214 are not aligned. |
| ----------------------------- Text Proposal (TP#6) for TS 38.213, subclause 9.2.5 --------------------------- 9.2.5 UE procedure for reporting multiple UCI types <omitted text>  A UE multiplexes DL HARQ-ACK information, with or without SR, and CSI report(s) in a same PUCCH if the UE is provided *simultaneousHARQ-ACK-CSI*; otherwise, the UE drops the CSI report(s) and includes only DL HARQ-ACK information, with or without SR, in the PUCCH. If the UE would transmit multiple PUCCHs in a slot that include DL HARQ-ACK information and CSI report(s), the UE expects to be provided a same configuration for *simultaneousHARQ-ACK-CSI* each of PUCCH formats 2, 3, and 4.  For the purposes of this clause, Part 2 CSI sub-reports [6, TS 38,214], if any, are considered as Part 2 CSI reports. |

TP#3 from ZTE for Part 1 CSI

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| Reason for changes:   * The specification does not support dropping Part 1 CSI report according to the sub-configuration level. |
| Summary of changes:   * Dropping of Part 1 CSI report according to the sub-configuration level. |
| Consequences if not approved   * The Part 1 CSI does not support sub-configuration level dropping. |
| ----------------------------- Text Proposal (TP#4) for TS38.214, Subclause 5.2.4 --------------------------- 5.2.4 CSI reporting using PUCCH <omitted text>  A UE is not expected to report CSI with a total number of UCI bits and CRC bits larger than 115 bits when configured with PUCCH format 4. For CSI reports transmitted on a PUCCH, if all CSI reports consist of one part, the UE may omit a portion of CSI reports. Omission of CSI is according to the priority order determined from the Prii,CSI(*y,k,c,s*) value as defined in Clause 5.2.5. For a *CSI-ReportConfig* containing a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], for a given CSI report which contains one or more CSIs, omission of CSI is done at a sub-configuration level, where a sub-configuration with an index, provided by [*csi-ReportSubConfigID*], with lower value has higher priority. CSI report is omitted beginning with the lowest priority level until the CSI report code rate is less or equal to the one configured by the higher layer parameter *maxCodeRate*. |
| ----------------------------- Text Proposal (TP#5) for TS38.213, Subclause 9.2.5 --------------------------- 9.2.5 UE procedure for reporting multiple UCI types <omitted text>  A UE multiplexes DL HARQ-ACK information, with or without SR, and CSI report(s) in a same PUCCH if the UE is provided *simultaneousHARQ-ACK-CSI*; otherwise, the UE drops the CSI report(s) and includes only DL HARQ-ACK information, with or without SR, in the PUCCH. If the UE would transmit multiple PUCCHs in a slot that include DL HARQ-ACK information and CSI report(s), the UE expects to be provided a same configuration for *simultaneousHARQ-ACK-CSI* each of PUCCH formats 2, 3, and 4.  For the purposes of this clause, Part 1 CSI sub-reports [6, TS 38,214], if any, are considered as Part 1 CSI reports. |

TP#4 from Fujitsu for Part 2 wideband CSI

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| * **Reason for changes**   When CSI reports with multiple sub-configurations are multiplexed with legacy CSI reports without sub-configurations, the omission rule for part 2 wideband CSIs is not clear.   * **Summary of changes**   For part 2 wideband CSIs, all the information at the same priority level is omitted together. For part 2 sub-band CSIs, for a given sub-band type from {even subband, odd subband}, the omission order follows the priority order determined by sub-configuration index.   * **Consequences if not approved**   The gNB and UE may have different understanding on the remaining CSIs that are reported.  ---------------------------------------------------- Start of the TP for TS38.214-------------------------------------------  **5.2.3 CSI reporting using PUSCH**  <Unrelated part omitted>  When CSI reporting on PUSCH comprises two parts, the UE may omit a portion of the Part 2 CSI. Omission of Part 2 CSI is according to the priority order shown in Table 5.2.3-1, where  is the number of CSI reports configured to be carried on the PUSCH. Priority 0 is the highest priority and priority  is the lowest priority and the CSI report *n* corresponds to the CSI report with the *n*th smallest Prii,CSI(*y,k,c,s*) value among the  CSI reports as defined in Clause 5.2.5. The subbands for a given CSI report *n* indicated by the higher layer parameter *csi-ReportingBand* with value '1' are numbered continuously in increasing order with the lowest subband of *csi-ReportingBand* with value set to '1' as subband 0. When omitting Part 2 CSI information for a particular priority level, the UE shall omit all of the information at that priority level, except when the corresponding CSI report contains multiple Part 2 subband CSIs each of which corresponding to a sub-configuration from a list of sub-configurations contained in the *CSI-ReportConfig* as described in Clause 5.2.1.1.  <Unrelated part omitted>  - For a Reporting Setting for which the *CSI-ReportConfig* contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], for a corresponding CSI report which contains one or more CSIs, omission of Part 2 subband CSI is done at a sub-configuration level within the same priority level defined by Table 5.2.3-1 where a sub-configuration with an index, provided by [*csi-ReportSubConfigID*], with lower value has higher priority.  <Unrelated part omitted>  ---------------------------------------------------- End of the TP for TS38.214------------------------------------------ |

TP#5 from Fujitsu for Part 1 (/one part) CSI

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| * **Reason for changes**   For the CSI report with multiple sub-configurations, adopt sub-configuration level omission of part 1 CSI.   * **Summary of changes**   Part 1 CSIs are dropped per sub-configuration level, in the ascending order of sub-configuration index.   * **Consequences if not approved**   Part 1 CSIs corresponding to multiple sub-configurations of one CSI report are omitted together.  ---------------------------------------------------- Start of the TP for TS38.214-------------------------------------------  **5.2.4 CSI reporting using PUCCH**  <Unrelated part omitted>  A UE is not expected to report CSI with a total number of UCI bits and CRC bits larger than 115 bits when configured with PUCCH format 4. For CSI reports transmitted on a PUCCH, if all CSI reports consist of one part, the UE may omit a portion of CSI reports. Omission of CSI is according to the priority order determined from the Prii,CSI(*y,k,c,s*) value as defined in Clause 5.2.5, except when the corresponding CSI report contains multiple one part CSIs each of which corresponding to a sub-configuration from a list of sub-configurations contained in the *CSI-ReportConfig* as described in Clause 5.2.1.1. For a Reporting Setting for which the *CSI-ReportConfig* contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], for a corresponding CSI report which contains one or more one part CSIs, omission is done according to the sub-configuration index provided by [*csi-ReportSubConfigID*], where a sub-configuration index with lower value has higher priority. CSI report is omitted beginning with the lowest priority level until the CSI report code rate is less or equal to the one configured by the higher layer parameter *maxCodeRate*.  <Unrelated part omitted>  ---------------------------------------------------- End of the TP for TS38.214------------------------------------------  ---------------------------------------------------- Start of the TP for TS38.213-------------------------------------------  **9.2.5.2 UE procedure for multiplexing HARQ-ACK/SR/CSI in a PUCCH**  <Unrelated part omitted>  - else, the UE drops all Part 2 CSI reports and selects  Part 1 CSI report(s) and, if any, Part 2 CSI sub-reports, from the  CSI reports in ascending priority value and, if any, index value of CSI sub-reports [6, TS 38.214], for transmission together with the HARQ-ACK and SR information bits where the value of  satisfies  and , where is a number of CRC bits corresponding to  UCI bits, and  is a number of CRC bits corresponding to  UCI bits.  <Unrelated part omitted>  ---------------------------------------------------- End of the TP for TS38.213------------------------------------------ |

TP#5 from vivo for Part 2 wideband CSI

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| * Reason for changes   + Part2 wideband CSI shouldn’t be omitted per sub-config level. * Summary of changes   + Changing the description of part2 CSI omission to fix the above issue. * Consequences if not approved   + Incorrect CSI omission rules for part2 CSI. * Text proposal for part2 subband CSI omission is shown in the following.  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **TS 38.214 V18.0.0**  5.2.3 CSI reporting using PUSCH  \*\*\* Unchanged text is omitted \*\*\*  When CSI reporting on PUSCH comprises two parts, the UE may omit a portion of the Part 2 CSI. Omission of Part 2 CSI is according to the priority order shown in Table 5.2.3-1, where  is the number of CSI reports configured to be carried on the PUSCH. Priority 0 is the highest priority and priority  is the lowest priority and the CSI report *n* corresponds to the CSI report with the *n*th smallest Prii,CSI(*y,k,c,s*) value among the  CSI reports as defined in Clause 5.2.5. The subbands for a given CSI report *n* indicated by the higher layer parameter *csi-ReportingBand* with value '1' are numbered continuously in increasing order with the lowest subband of *csi-ReportingBand* with value set to '1' as subband 0. When omitting Part 2 CSI information for a particular priority level, the UE shall omit all of the information at that priority level, except when the corresponding CSI report contains multiple Part 2 CSIs each of which corresponding to a sub-configuration from a list of sub-configurations contained in the *CSI-ReportConfig* as described in Clause 5.2.1.1.  - For Enhanced Type II reports, for a given CSI report , each reported element of indices and , indexed by and , is associated with a priority value , with with , , and , and where is defined in Clause 5.2.2.2.5. The element with the highest priority has the lowest associated value . Omission of Part 2 CSI is according to the priority order shown in Table 5.2.3-1, where  - Group 0 includes indices (if reported), (if reported) and ().  - Group 1 includes indices (if reported), (if reported), the highest priority elements of , , the highest priority elements of and the highest priority elements of ().  - Group 2 includes the lowest priority elements of , the lowest priority elements of and the lowest priority elements of ().  - For Further Enhanced Type II Port Selection reports, for a given CSI report , each reported element of and , indexed by , and , is associated with a priority value , with , and . The element with the highest priority has the lowest associated value . Omission of Part 2 CSI is according to the priority order shown in Table 5.2.3-1, where:  - Group 0 includes (if reported), () and (if reported).  - Group 1 includes the highest priority elements of (if reported), , the highest priority elements of and the highest priority elements of ().  - Group 2 includes the lowest priority elements of (if reported), the lowest priority elements of and the lowest priority elements of ().  - For a Reporting Setting for which the *CSI-ReportConfig* contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], for a corresponding CSI report which contains one or more CSIs, omission of Part 2 subband CSI is done at a sub-configuration level within the same priority level defined by Table 5.2.3-1 where a sub-configuration with an index, provided by [*csi-ReportSubConfigID*], with lower value has higher priority.  Table 5.2.3-1: Priority reporting levels for Part 2 CSI   |  | | --- | | Priority 0:  For CSI reports 1 to , Group 0 CSI for CSI reports configured as 'typeII-r16', 'typeII-PortSelection-r16' or 'typeII-PortSelection-r17'; Part 2 wideband CSI for CSI reports configured otherwise | | Priority 1:  Group 1 CSI for CSI report 1, if configured as 'typeII-r16', 'typeII-PortSelection-r16' or 'typeII-PortSelection-r17'; Part 2 subband CSI of even subbands for CSI report 1, if configured otherwise | | Priority 2:  Group 2 CSI for CSI report 1, if configured as 'typeII-r16', 'typeII-PortSelection-r16' or 'typeII-PortSelection-r17'; Part 2 subband CSI of odd subbands for CSI report 1, if configured otherwise | | Priority 3:  Group 1 CSI for CSI report 2, if configured as 'typeII-r16', 'typeII-PortSelection-r16' or 'typeII-PortSelection-r17'; Part 2 subband CSI of even subbands for CSI report 2, if configured otherwise | | Priority 4:  Group 2 CSI for CSI report 2, if configured as 'typeII-r16', 'typeII-PortSelection-r16' or 'typeII-PortSelection-r17'. Part 2 subband CSI of odd subbands for CSI report 2, if configured otherwise | | ⁞ | | Priority :  Group 1 CSI for CSI report , if configured as 'typeII-r16', 'typeII-PortSelection-r16' or 'typeII-PortSelection-r17'; Part 2 subband CSI of even subbands for CSI report , if configured otherwise | | Priority :  Group 2 CSI for CSI report , if configured as 'typeII-r16', 'typeII-PortSelection-r16' or 'typeII-PortSelection-r17'; Part 2 subband CSI of odd subbands for CSI report , if configured otherwise |   <omitted text> | |

TP#6 from Intel

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| **Reasons for change:**  Ambiguous CSI sub-report dropping rules after all sub-report of a priority level is omitted.  **Summary of change:**  Clarify that if all CSIs of a priority level is omitted, then next omission is performed in the next higher priority level.  **Consequences if not approved:**  Ambiguous specification. |
| =========== TP for TS38.213 =============  5.2.3 CSI reporting using PUSCH  *-- unchanged text omitted –*  Clause 5.2.5. The subbands for a given CSI report *n* indicated by the higher layer parameter *csi-ReportingBand* with value '1' are numbered continuously in increasing order with the lowest subband of *csi-ReportingBand* with value set to '1' as subband 0. When omitting Part 2 CSI information for a particular priority level, the UE shall omit all of the information at that priority level, except when the corresponding CSI report contains one or more Part 2 CSIs each of which corresponding to a sub-configuration from a list of sub-configurations contained in the *CSI-ReportConfig* as described in Clause 5.2.1.1.  *-- unchanged text omitted –*  - For a Reporting Setting for which the *CSI-ReportConfig* contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], for a corresponding CSI report which contains one or more CSIs, omission of Part 2 CSI is done at a sub-configuration level within the same priority level defined by Table 5.2.3-1 where a sub-configuration with an index, provided by [*csi-ReportSubConfigID*], with lower value has higher priority. If Part 2 CSIs of a priority level is all omitted, then further omission, if needed, is performed for Part 2 CSIs of the next higher priority level.  *-- unchanged text omitted --* |

TP#7 from OPPO

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| ------------ start of TP for TS 38.214 -----------------------  5.2.4 CSI reporting using PUCCH  <unchanged parts are omitted>  A UE is not expected to report CSI with a total number of UCI bits and CRC bits larger than 115 bits when configured with PUCCH format 4. For CSI reports transmitted on a PUCCH, if all CSI reports consist of one part, the UE may omit a portion of CSI reports. Omission of CSI is according to the priority order determined from the Prii,CSI(*y,k,c,s*) value as defined in Clause 5.2.5. Omission of CSI is done at a sub-configuration level, if configured, within the same priority level, where a sub-configuration with an index with lower value has higher priority. CSI report is omitted beginning with the lowest priority level until the CSI report code rate is less or equal to the one configured by the higher layer parameter *maxCodeRate*.  <unchanged parts are omitted>  ------------ end of TP for TS 38.214 ----------------------- |

TP#8 from CTC for Part 2 wideband CSI

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| * Reason for changes * Current text implies that all Part 2 wideband CSI reports with sub-configuration have the same priority level. * Current text “provided by [csi-ReportSubConfigID], with lower value has higher priority” doesn’t imply that the priority of sub-configuration indicated by [csi-ReportSubConfigID] should be taken into consideration when drop the Part 2 CSI by sub-configurations * Summary of changes   + Modifying the text on Part 2 CSI dropping rules to clarify how to drop the Part2 CSI by sub-configuration in section 5.2.3 * Consequences if not approved   + Different understandings may exist on whether the sub-configurations should be dropped together or one by one in the order of sub-configuration index.   **------------------------------------ Text Proposal (TP#1) for 38.214, Sections 5.2.3 -------------------------------------**  5.2.3 CSI reporting using PUSCH  <Unchanged text omitted>  When CSI reporting on PUSCH comprises two parts, the UE may omit a portion of the Part 2 CSI. Omission of Part 2 CSI is according to the priority order shown in Table 5.2.3-1, where  is the number of CSI reports configured to be carried on the PUSCH. Priority 0 is the highest priority and priority  is the lowest priority and the CSI report n corresponds to the CSI report with the nth smallest Prii,CSI(y,k,c,s) value among the  CSI reports as defined in Clause 5.2.5. The subbands for a given CSI report n indicated by the higher layer parameter csi-ReportingBand with value '1' are numbered continuously in increasing order with the lowest subband of csi-ReportingBand with value set to '1' as subband 0. When omitting Part 2 CSI information for a particular priority level, the UE shall omit all of the information at that priority level, except when the corresponding CSI report contains multiple Part 2 CSIs each of which corresponding to a sub-configuration from a list of sub-configurations contained in the CSI-ReportConfig as described in Clause 5.2.1.1.  <Unchanged text omitted>   * For a Reporting Setting for which the CSI-ReportConfig contains a list of sub-configurations provided by the higher layer parameter [csi-ReportSubConfigList], for a corresponding CSI report which contains one or more CSIs, omission of Part 2 CSI is done at a sub-configuration level within the same priority level defined by Table 5.2.3-1 and indicated by the  ~~where a sub-configuration with an~~ index~~,~~ provided by [csi-ReportSubConfigID] for each sub-configuration, where~~, with~~ lower value has higher priority.   <Unchanged text omitted> |

TP#9 from CTC for Part 1 CSI

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| * Reason for changes * Current text doesn’t imply how to drop the Part 1 CSI when sub-configuration exists * Summary of changes   + adding dropping rules when sub-configuration is configured for Part 1 CSI dropping. * Consequences if not approved   + How to drop Part 1 CSI with sub-configuration is unclear.   **------------------------------ Text Proposal (TP#2) for 38.214, Sections 5.2.4 --------------------------**  5.2.4 CSI reporting using PUCCH  <Unchanged text omitted>  A UE is not expected to report CSI with a total number of UCI bits and CRC bits larger than 115 bits when configured with PUCCH format 4. For CSI reports transmitted on a PUCCH, if all CSI reports consist of one part, the UE may omit a portion of CSI reports. Omission of CSI is according to the priority order determined from the Prii,CSI(y,k,c,s) value as defined in Clause 5.2.5. For CSI-ReportConfig contains a list of sub-configurations provided by the higher layer parameter [csi-ReportSubConfigList], omission of Part 1 CSI is done at a sub-configuration level with the priority indicated by the index provided by [csi-ReportSubConfigID] for each sub-configuration, with lower value has higher priority. CSI report is omitted beginning with the lowest priority level until the CSI report code rate is less or equal to the one configured by the higher layer parameter maxCodeRate..  <Unchanged text omitted> |

TP#10 from Apple for Part 2 wideband CSI

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| **Reason for change:** The current spec allows sub-configuration level of Part 2 Wideband CSI omission |
| **Summary of change:** Omission of Part 2 wideband CSI when needed, is done as legacy in report level |
| **Consequences if not approved:**UE omission behaviour for Part 2 WB CSI is unclear and unnecessarily complicated |
| -----------------------------------------------------------Text proposal -----------------------------------------------------------  TS38.214  5.2.3 CSI reporting using PUSCH  <Unchanged parts omitted>  When CSI reporting on PUSCH comprises two parts, the UE may omit a portion of the Part 2 CSI. Omission of Part 2 CSI is according to the priority order shown in Table 5.2.3-1, where  is the number of CSI reports configured to be carried on the PUSCH. Priority 0 is the highest priority and priority  is the lowest priority and the CSI report *n* corresponds to the CSI report with the *n*th smallest Prii,CSI(*y,k,c,s*) value among the  CSI reports as defined in Clause 5.2.5. The subbands for a given CSI report *n* indicated by the higher layer parameter *csi-ReportingBand* with value '1' are numbered continuously in increasing order with the lowest subband of *csi-ReportingBand* with value set to '1' as subband 0. When omitting Part 2 CSI information for a particular priority level, the UE shall omit all of the information at that priority level, except when the corresponding CSI report contains multiple Part 2 subband CSIs each of which corresponding to a sub-configuration from a list of sub-configurations contained in the *CSI-ReportConfig* as described in Clause 5.2.1.1.  ......  - For a Reporting Setting for which the *CSI-ReportConfig* contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], for a corresponding CSI report which contains one or more CSIs, omission of Part 2 subband CSI is done at a sub-configuration level within the same priority level defined by Table 5.2.3-1 where a sub-configuration with an index, provided by [*csi-ReportSubConfigID*], with lower value has higher priority.  <Unchanged parts omitted>  -------------------------------------------------------End of Text proposal ------------------------------------------------------ |

TP#11 from Apple for Part 1 CSI

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| **Reason for change:** The current spec does not support sub-configuration level of Part 1 CSI omission |
| **Summary of change:** Omission of Part 1 CSI when needed, is done at sub-configuration level |
| **Consequences if not approved:**UE drops CSI Part 1 with all sub-configuration together at the same time |
| -----------------------------------------------------------Text proposal -----------------------------------------------------------  TS38.214  5.2.4 CSI reporting using PUCCH  <Unchanged parts omitted>  A UE is not expected to report CSI with a total number of UCI bits and CRC bits larger than 115 bits when configured with PUCCH format 4. For CSI reports transmitted on a PUCCH, if all CSI reports consist of one part, the UE may omit a portion of CSI reports. Omission of CSI is according to the priority order determined from the Prii,CSI(*y,k,c,s*) value as defined in Clause 5.2.5. CSI report is omitted beginning with the lowest priority level until the CSI report code rate is less or equal to the one configured by the higher layer parameter *maxCodeRate*. For a Reporting Setting for which the CSI-ReportConfig contains a list of sub-configurations provided by the higher layer parameter [csi-ReportSubConfigList], for a corresponding CSI report which contains one or more CSIs, omission of Part 1 CSI is done at a sub-configuration level within the same priority level defined by Table 5.2.3-1 where a sub-configuration with an index, provided by [csi-ReportSubConfigID], with lower value has higher priority.  <Unchanged parts omitted>  -------------------------------------------------------End of Text proposal ------------------------------------------------------ |

TP#12 from LGe for CSI omission for 213

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| **Reason for Change:**   * Priority value in 213 specification is not aligned with that in 214 specification. * Whether sub-configuration level omission is supported or not for CSI without two parts, Part 1 CSI, and Part 2 CSI is unclear.   **Summary of Change:**   * “Priority value” in TS 38.213 clause 9.2.5.2 is changed to “priority level” considering the alignment with TS 38.214 clause 5.2.4. * Sub-configuration level CSI omission for CSI without two parts, Part 1 CSI, and Part 2 CSI is supported.   **Consequences if not approved:**   * Unclear UE behavior to perform omission of CSI corresponding to a CSI report configuration containing a list of sub-configurations.   9.2.5.2 UE procedure for multiplexing HARQ-ACK/SR/CSI in a PUCCH  For a transmission occasion of a single CSI report, a PUCCH resource is provided by *pucch-CSI-ResourceList*. For a transmission occasion of multiple CSI reports, corresponding PUCCH resources can be provided by *multi-CSI-PUCCH-ResourceList*. If a UE is provided first and second *PUCCH-Config*, *multi-CSI-PUCCH-ResourceList* is provided by the first *PUCCH-Config*, and *PUCCH-ResourceId* in *pucch-CSI-ResourceList* or *multi-CSI-PUCCH-ResourceList* indicates a corresponding PUCCH resource in *PUCCH-Resource* provided by the first *PUCCH-Config*.  If a UE is provided only one PUCCH resource set for transmission of HARQ-ACK information in response to PDSCH reception scheduled by a DCI format or in response to a DCI format having associated HARQ-ACK information without scheduling PDSCH reception, the UE does not expect to be provided *simultaneousHARQ-ACK-CSI*.  A UE is configured by *maxCodeRate* a code rate for multiplexing HARQ-ACK, SR, and CSI report(s) in a PUCCH transmission using PUCCH format 2, PUCCH format 3, or PUCCH format 4.  If a UE transmits CSI reports using PUCCH format 2, the UE transmits only wideband CSI for each CSI report [6, TS 38.214]. In the following, a Part 1 CSI report refers either to a CSI report with only wideband CSI or to a Part 1 CSI report with wideband CSI and sub-band CSI.  Denote as  -  a total number of HARQ-ACK information bits, if any  -  a total number of SR bits.  if there is no scheduling request bit; otherwise,  as described in clause 9.2.5.1  - , where  is a number of Part 1 CSI report bits for CSI report or CSI sub-report if provided, with priority level ,  is a number of Part 2 CSI report bits, if any, for CSI report or CSI sub-report if provided, with priority level  [6, TS 38.214], and and are respectively a number of priority levels corresponding to Part 1 CSI and Part 2 CSI for CSI reports that include overlapping CSI reports  - , where  is a number of CRC bits, if any, for encoding HARQ-ACK, SR and Part 1 CSI report bits and  is a number of CRC bits, if any, for encoding Part 2 CSI report bits  In the following  - is a code rate given by *maxCodeRate* as in Table 9.2.5.2-1.  -  is a number of PRBs provided by *nrofPRBs*; otherwise, if *nrofPRBs* is not provided,  -  for PUCCH format 2 or, if the PUCCH resource with PUCCH format 2 includes an orthogonal cover code with length  provided by *occ-Length*, ,  for PUCCH format 3 or, if the PUCCH resource with PUCCH format 3 includes an orthogonal cover code with length  provided by *occ-Length*, , and  for PUCCH format 4, where  is a number of subcarriers per resource block [4, TS 38.211]  -  is equal to a number of PUCCH symbols  for PUCCH format 2 provided by *nrofSymbols* in *PUCCH-format2*. For PUCCH format 3 or for PUCCH format 4,  is equal to a number of PUCCH symbols  for PUCCH format 3 or equal to a number of PUCCH symbols  for PUCCH format 4 provided by *nrofSymbols* in *PUCCH-format3* or *nrofSymbols* in *PUCCH-format4*, respectively, after excluding a number of symbols used for DM-RS transmission for PUCCH format 3 or for PUCCH format 4, respectively [4, TS 38.211]  -  if pi/2-BPSK is the modulation scheme and  if QPSK is the modulation scheme as indicated by *pi2BPSK* for PUCCH format 3 or PUCCH format 4. For PUCCH format 2,  If a UE has one or more CSI reports and zero or more HARQ-ACK/SR information bits to transmit in a PUCCH where the HARQ-ACK, if any, is in response to a PDSCH reception without a corresponding PDCCH  - if any of the CSI reports are overlapping and the UE is provided by *multi-CSI-PUCCH-ResourceList* with  PUCCH resources in a slot, for PUCCH format 2 and/or PUCCH format 3 and/or PUCCH format 4, as described in clause 9.2.1, where the resources are indexed according to an ascending order for the product of a number of corresponding REs, modulation order , and configured code rate ;  - if , the UE uses PUCCH format 2 resource , or the PUCCH format 3 resource , or the PUCCH format 4 resource  - else if  and , , the UE transmits a PUCCH conveying HARQ-ACK information, SR and CSI report(s) in a respective PUCCH where the UE uses the PUCCH format 2 resource , or the PUCCH format 3 resource , or the PUCCH format 4 resource  - else the UE uses the PUCCH format 2 resource , or the PUCCH format 3 resource , or the PUCCH format 4 resource  and the UE selects  CSI report(s) and, if any, CSI sub-report(s), for transmission together with HARQ-ACK information and SR, when any, in ascending priority level as described in [6, TS 38.214]  - else, the UE transmits the  bits in a PUCCH resource provided by *pucch-CSI-ResourceList* and determined as described in clause 9.2.5  If a UE has HARQ-ACK, SR and wideband or sub-band CSI reports to transmit and the UE determines a PUCCH resource with PUCCH format 2, or the UE has HARQ-ACK, SR and wideband CSI reports [6, TS 38.214] to transmit and the UE determines a PUCCH resource with PUCCH format 3 or PUCCH format 4, where  - the UE determines the PUCCH resource using the PUCCH resource indicator field [5, TS 38.212] in a last of a number of DCI formats, excluding the SPS activation DCI, with a value of a PDSCH-to-HARQ\_feedback timing indicator field, if present, or a value of *dl-DataToUL-ACK*, or *dl-DataToUL-ACK-r16*, or *dl-DataToUL-ACK-DCI-1-2*, or *dl-DataToUL-ACK-r17,* or *dl-DataToUL-ACK-DCI-1-2-r17*, indicating a same slot for the PUCCH transmission, from a PUCCH resource set provided to the UE for HARQ-ACK transmission, and  - the UE determines the PUCCH resource set as described in clause 9.2.1 and clause 9.2.3 for UCI bits  and  - if , the UE transmits the HARQ-ACK, SR, and CSI reports bits by selecting the minimum number of the PRBs satisfying as described in clauses 9.2.3 and 9.2.5.1;  - else, the UE selects CSI report(s) and, if any, CSI sub-report(s), from the CSI report priority levels, for transmission together with HARQ-ACK and SR in ascending priority level [6, TS 38.214], where the value of satisfies and , where is a number of CRC bits corresponding to UCI bits, and is a number of CRC bits corresponding to UCI bits.  If a UE is provided a first interlace of PRBs by *interlace0* in *InterlaceAllocation*, the UE has HARQ-ACK, SR and wideband or sub-band CSI reports to transmit, and the UE determines a PUCCH resource with PUCCH format 2, or the UE has HARQ-ACK, SR and wideband CSI reports to transmit and the UE determines a PUCCH resource with PUCCH format 3, where  - the UE determines the PUCCH resource using the PUCCH resource indicator field in a last of a number of DCI formats, excluding the SPS activation DCI, with a value of a PDSCH-to-HARQ\_feedback timing indicator field, or a value provided by *dl-DataToUL-ACK* or *dl-DataToUL-ACK-r16* or *dl-DataToUL-ACK-DCI-1-2* or *dl-DataToUL-ACK-r17* or *dl-DataToUL-ACK-DCI-1-2-r17* if the PDSCH-to-HARQ\_feedback timing indicator field is not present in a DCI format, indicating a same slot for the PUCCH transmission, from a PUCCH resource set provided to the UE for HARQ-ACK transmission, and  - the UE determines the PUCCH resource set as described in clauses 9.2.1 and 9.2.3 for UCI bits  and  - if , the UE transmits the HARQ-ACK, SR, and CSI reports bits in a PUCCH over the first interlace  - else, if the UE is provided a second interlace of PRBs by *interlace1* and if , the UE transmits the HARQ-ACK, SR, and CSI reports bits in a PUCCH over both the first and second interlaces  - else, the procedure is same as the corresponding one when the UE is provided *PUCCH-ResourceSet* by replacing with , or, if the UE is provided *interlace1*, by .  If a UE has HARQ-ACK, SR and sub-band CSI reports to transmit and the UE determines a PUCCH resource with PUCCH format 3 or PUCCH format 4, where  - the UE determines the PUCCH resource using the PUCCH resource indicator field [5, TS 38.212] in a last of a number of DCI formats, excluding the SPS activation DCI, with a value of a PDSCH-to-HARQ\_feedback timing indicator field indicating a same slot for the PUCCH transmission, or by a value provided by *dl-DataToUL-ACK* or *dl-DataToUL-ACK-r16* or *dl-DataToUL-ACK-DCI-1-2* or *dl-DataToUL-ACK-r17* or *dl-DataToUL-ACK-DCI-1-2-r17* if the PDSCH-to-HARQ\_feedback timing indicator field is not present in the last DCI format, from a PUCCH resource set provided to the UE for HARQ-ACK transmission, and  - the UE determines the PUCCH resource set as described in clause 9.2.1 and clause 9.2.3 for UCI bits  and  - if , the UE transmits the HARQ-ACK, SR and the  CSI report bits by selecting the minimum number  of PRBs from the  PRBs satisfying  as described in clauses 9.2.3 and 9.2.5.1  - else,  - if for  Part 2 CSI report priority level(s), it is  and  ,  the UE selects the first  Part 2 CSI reports and, if any, Part 2 CSI sub-report(s), according to respective priority level(s) [6, TS 38.214], for transmission together with the HARQ-ACK, SR and priority levels for Part 1 CSI reports , where  is the number of Part 1 CSI report bits for the  CSI report priority level and  is the number of Part 2 CSI report bits for the  CSI report priority level,  is a number of CRC bits corresponding to , and  is a number of CRC bits corresponding to  - else, the UE drops all Part 2 CSI reports and selects  Part 1 CSI report(s) and, if any, Part 1 CSI sub-report(s), from the CSI report priority levels in ascending priority level [6, TS 38.214], for transmission together with the HARQ-ACK and SR information bits where the value of  satisfies  and , where is a number of CRC bits corresponding to  UCI bits, and  is a number of CRC bits corresponding to  UCI bits.  If a UE is provided a first interlace of PRBs by *interlace0* in *InterlaceAllocation*, the UE has HARQ-ACK, SR and sub-band CSI reports to transmit, and the UE determines a PUCCH resource with PUCCH format 3, where  - the UE determines the PUCCH resource using the PUCCH resource indicator field in a last of a number of DCI formats, excluding the SPS activation DCI, that have a value of a PDSCH-to-HARQ\_feedback timing indicator field indicating a same slot for the PUCCH transmission, or a value provided by *dl-DataToUL-ACK* or *dl-DataToUL-ACK-r16* or *dl-DataToUL-ACK-DCI-1-2* or *dl-DataToUL-ACK-r17* or *dl-DataToUL-ACK-DCI-1-2-r17* if the PDSCH-to-HARQ\_feedback timing indicator field is not present in the last DCI format, from a PUCCH resource set provided to the UE for HARQ-ACK transmission, and  - the UE determines the PUCCH resource set as described in clauses 9.2.1 and 9.2.3 for UCI bits  and  - if , the UE transmits the HARQ-ACK, SR and the CSI report bits in a PUCCH over the first interlace  - else if the UE is provided a second interlace of PRBs by *interlace1* and if , the UE transmits the HARQ-ACK, SR, and CSI reports bits in a PUCCH over both the first and second interlaces  - else, the procedure is same as the corresponding one when the UE is provided *PUCCH-ResourceSet* by replacing with , or, if the UE is provided *interlace1*, with .  **Table 9.2.5.2-1: Code rate corresponding to value of *maxCodeRate***   |  |  | | --- | --- | | *maxCodeRate* | **Code rate** | | | 0 | 0.08 | | 1 | 0.15 | | 2 | 0.25 | | 3 | 0.35 | | 4 | 0.45 | | 5 | 0.60 | | 6 | 0.80 | | 7 | Reserved | |

TP#13 from LGe for CSI omission for 214

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| **Reason for Change:**   * Whether sub-configuration level omission is supported or not for Part 1 CSI, CSI without two parts, and wideband Part 2 CSI is unclear.   **Summary of Change:**   * It is clarified that sub-configuration level omission of Part 2 CSI is supported except for Priority 0. * Sub-configuration level CSI omission for Part 1 CSI and CSI without two parts is supported.   **Consequences if not approved:**   * Unclear UE behavior to perform omission of CSI corresponding to a CSI report configuration containing a list of sub-configurations.   5.2.3 CSI reporting using PUSCH  <Unchanged texts omitted>  - For a Reporting Setting for which the *CSI-ReportConfig* contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], for a corresponding CSI report which contains one or more CSIs, omission of Part 2 CSI except for Priority 0 is done at a sub-configuration level within the same priority level defined by Table 5.2.3-1 where a sub-configuration with an index, provided by [*csi-ReportSubConfigID*], with lower value has higher priority.  <Unchanged texts omitted>  5.2.4 CSI reporting using PUCCH  <Unchanged texts omitted>  A UE is not expected to report CSI with a total number of UCI bits and CRC bits larger than 115 bits when configured with PUCCH format 4. For CSI reports transmitted on a PUCCH, if all CSI reports consist of one part, the UE may omit a portion of CSI reports. Omission of CSI is according to the priority order determined from the Prii,CSI(*y,k,c,s*) value as defined in Clause 5.2.5. For a Reporting Setting for which the *CSI-ReportConfig* contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], for a corresponding CSI report which contains one or more CSIs, omission of CSI is done at a sub-configuration level within the same priority order determined from the Prii,CSI(*y,k,c,s*) value where a sub-configuration with an index, provided by [*csi-ReportSubConfigID*], with lower value has higher priority. CSI report is omitted beginning with the lowest priority level until the CSI report code rate is less or equal to the one configured by the higher layer parameter *maxCodeRate*.  If any of the CSI reports consist of two parts, the UE may omit a portion of Part 2 CSI. Omission of Part 2 CSI is according to the priority order shown in Table 5.2.3-1. For a Reporting Setting for which the *CSI-ReportConfig* contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], for a given CSI report which contains one or more CSIs, omission of Part 2 CSI is defined in Clause 5.2.3. Part 2 CSI is omitted beginning with the lowest priority level until the Part 2 CSI code rate is less or equal to the one configured by higher layer parameter *maxCodeRate*. |

TP#14 from Ericsson for Part 1 CSI

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| * Reason for changes   + Support CSI Part 1 dropping at sub-configuration level to be consistent with CSI Part 2 dropping at sub-configuration level * Summary of changes   + Add procedure text to support CSI Part 1 dropping at sub-configuration level to be consistent with CSI Part 2 dropping at sub-configuration level * Consequences if not approved   + Inconsistent dropping behavior between CSI Part 1 and Part 2   ---------------------------------------- Text Proposal (TP#2) for 38.214, Section 5.2.4 ----------------------------------------  \*\*\* Unchanged text omitted \*\*\*  A UE is not expected to report CSI with a total number of UCI bits and CRC bits larger than 115 bits when configured with PUCCH format 4. For CSI reports transmitted on a PUCCH, if all CSI reports consist of one part, the UE may omit a portion of CSI reports. Omission of CSI is according to the priority order determined from the Prii,CSI(*y,k,c,s*) value as defined in Clause 5.2.5. CSI report is omitted beginning with the lowest priority level until the CSI report code rate is less or equal to the one configured by the higher layer parameter *maxCodeRate*. For a Reporting Setting for which the *CSI-ReportConfig* contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], omission is done at a sub-configuration level within the same priority level, where a sub-configuration with lower index provided by [*csi-ReportSubConfigID*] has higher priority.  \*\*\* Unchanged text omitted \*\*\*  ----------------------------------------------------------- End Text Proposal ---------------------------------------------------------- |

**Issue 7**

TP#1 from ZTE

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| Reason for changes:   * Current restriction precludes the flexibility of configurations of multi-CSI for NES, especially for type 2 SD adaptation. |
| Summary of changes:   * Use a larger threshold of the number of resources for different number of CSI-RS ports (option 1 for TP#2) or apply the restriction in sub-configuration level, instead of CSI report level (option 2 for TP#2). |
| Consequences if not approved   * The flexibility of configurations of multi-CSI for NES is limited. |
| ----------------------------- Text Proposal (Option 1 of TP#2) for TS 38.214, Subclause 5.2.1.4.2 --------------------------- 5.2.1.4.2 Report Quantity Configurations <omitted text>  If the UE is configured with a *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to 'cri-RSRP', 'cri-RI-PMI-CQI ', 'cri-RI-i1', 'cri-RI-i1-CQI', 'cri-RI-CQI', 'cri-RI-LI-PMI-CQI', 'cri-SINR', or 'cri-SINR- Index ', and resources are configured in the corresponding resource set for channel measurement, then the UE shall derive the CSI parameters other than CRI conditioned on the reported CRI, where CRI *k* (*k* ≥ 0) corresponds to the configured (*k*+1)-th entry of associated *nzp-CSI-RS-Resources* in the corresponding *NZP-CSI-RS-ResourceSet* for channel measurement, and (*k*+1)-th entry of associated *csi-IM-Resource* in the corresponding *csi-IM-ResourceSet* (if configured) or (*k*+1)-th entry of associated *nzp-CSI-RS-Resources* in the corresponding *NZP-CSI-RS-ResourceSet* (if configured for *CSI-ReportConfig* with *reportQuantity* set to 'cri-SINR' or 'cri-SINR- Index ') for interference measurement. When a CSI report does not contain a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], for the CSI-RS resource set associated with the CSI report, if CSI-RS resources are configured, each resource shall contain at most 16 CSI-RS ports. If CSI-RS resources are configured, each resource shall contain at most 8 CSI-RS ports. When a CSI report contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], for the CSI-RS resource set associated with the CSI report, if CSI-RS resources are configured, each resource shall contain at most 32 CSI-RS ports; if CSI-RS resources are configured, each resource shall contain at most 16 CSI-RS ports; if CSI-RS resources are configured, each resource shall contain at most 8 CSI-RS ports.  <omitted text>  If the UE is configured with a *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to 'cri-RI-PMI-CQI', ' cri-RI-i1', 'cri-RI-i1-CQI', 'cri-RI-CQI' or 'cri-RI-LI-PMI-CQI', if a CSI report does not contain a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], then the UE is not expected to be configured with more than 8 CSI-RS resources in a CSI-RS resource set contained within a resource setting that is linked to the *CSI-ReportConfig*. If a CSI report contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], then the UE is not expected to be configured with more than 16 CSI-RS resources in a CSI-RS resource set contained within a resource setting that is linked to the *CSI-ReportConfig*.  <omitted text> |
| ----------------------------- Text Proposal (Option 2 of TP#2) for TS 38.214, Subclause 5.2.1.4.2 --------------------------- 5.2.1.4.2 Report Quantity Configurations <omitted text>  If the UE is configured with a *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to 'cri-RSRP', 'cri-RI-PMI-CQI ', 'cri-RI-i1', 'cri-RI-i1-CQI', 'cri-RI-CQI', 'cri-RI-LI-PMI-CQI', 'cri-SINR', or 'cri-SINR- Index ', and resources are configured in the corresponding resource set for channel measurement, then the UE shall derive the CSI parameters other than CRI conditioned on the reported CRI, where CRI *k* (*k* ≥ 0) corresponds to the configured (*k*+1)-th entry of associated *nzp-CSI-RS-Resources* in the corresponding *NZP-CSI-RS-ResourceSet* for channel measurement, and (*k*+1)-th entry of associated *csi-IM-Resource* in the corresponding *csi-IM-ResourceSet* (if configured) or (*k*+1)-th entry of associated *nzp-CSI-RS-Resources* in the corresponding *NZP-CSI-RS-ResourceSet* (if configured for *CSI-ReportConfig* with *reportQuantity* set to 'cri-SINR' or 'cri-SINR- Index ') for interference measurement. When a CSI report does not contain a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], for the CSI-RS resource set associated with the CSI report, if CSI-RS resources are configured, each resource shall contain at most 16 CSI-RS ports. If CSI-RS resources are configured, each resource shall contain at most 8 CSI-RS ports. When a CSI report contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], for the CSI-RS resource associated with one sub-configuration, if CSI-RS resources are associated with one sub-configuration, each resource shall contain at most 16 CSI-RS ports. If CSI-RS resources are associated with one sub-configuration, each resource shall contain at most 8 CSI-RS ports.  <omitted text>  If the UE is configured with a *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to 'cri-RI-PMI-CQI', ' cri-RI-i1', 'cri-RI-i1-CQI', 'cri-RI-CQI' or 'cri-RI-LI-PMI-CQI', if a CSI report does not contain a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], then the UE is not expected to be configured with more than 8 CSI-RS resources in a CSI-RS resource set contained within a resource setting that is linked to the *CSI-ReportConfig*. If a CSI report contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], then the UE is not expected to be configured with more than 16 CSI-RS resources in a CSI-RS resource set contained within a resource setting that is linked to the *CSI-ReportConfig*.  <omitted text> |

TP#2 from Transsion

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| *<----------Text proposal 1----------->* 38.214 5.2.1.4.2 Report Quantity Configurations  \*\*\* Unchanged text is omitted \*\*\*  If the UE is configured with a *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to 'cri-RSRP', 'cri-RI-PMI-CQI ', 'cri-RI-i1', 'cri-RI-i1-CQI', 'cri-RI-CQI', 'cri-RI-LI-PMI-CQI', 'cri-SINR', or 'cri-SINR- Index ', and resources are configured in the corresponding resource set for channel measurement, then the UE shall derive the CSI parameters other than CRI conditioned on the reported CRI, where CRI *k* (*k* ≥ 0) corresponds to the configured (*k*+1)-th entry of associated *nzp-CSI-RS-Resources* in the corresponding *NZP-CSI-RS-ResourceSet* for channel measurement, and (*k*+1)-th entry of associated *csi-IM-Resource* in the corresponding *csi-IM-ResourceSet* (if configured) or (*k*+1)-th entry of associated *nzp-CSI-RS-Resources* in the corresponding *NZP-CSI-RS-ResourceSet* (if configured for *CSI-ReportConfig* with *reportQuantity* set to 'cri-SINR' or 'cri-SINR- Index ') for interference measurement. If CSI-RS resources are configured, each resource shall contain at most 16 CSI-RS ports. If CSI-RS resources are configured, each resource shall contain at most 8 CSI-RS ports. For CSI-RS resources associated with sub-configuration, where each sub-configuration is identified by [*csi-ReportSubConfigID*], If CSI-RS resources are configured per sub-configuration, each resource shall contain at most 16 CSI-RS ports. If CSI-RS resources are configured per sub-configuration, each resource shall contain at most 8 CSI-RS ports.  \*\*\* Unchanged text is omitted \*\*\* |

**Issue 8**

TP#1 from Fujitsu

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| * **Reason for changes**   + There is no interpretation of CRI reporting for spatial domain adaptation in current TS38.214. * **Summary of changes**   + Add the interpretation of CRI reporting on CMR/IMR for SD type 1 and type 2 adaptation.   + Add the condition of CRI reporting on CMR/IMR for SD type 1 and type 2 adaptation.   + Add the association between the index within the resource list and the resource set for SD type 2 adaptation. * **Consequences if not approved**   + The correspondence between CRI and CMR/IMR may not be aligned between the gNB side and UE side.   ---------------------------------------------------- Start of the TP for TS38.214-------------------------------------------  **5.2.1.4.2 Report Quantity Configurations**  <Unrelated part omitted>  If the UE is configured with a *CSI-ReportConfig* that contains a list of sub-configurations, provided by the higher layer parameter [*csi-ReportSubConfigList]*:  <Unrelated part omitted>  - A sub-configuration can be configured with a power offset provided by [*powerOffse*t].  - If a sub-configurations is not configured with [*nzp-CSI-RS-resourceList*] then the sub-configuration shall be associated with all the NZP CSI-RS resources within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement which corresponds to the *CSI-ReportConfig.*  - the UE reports CSI(s) for one or more sub-configurations according to Clauses 5.2.1.5.1, 5.2.1.5.2, 5.2.3 and 5.2.4, and according to the higher layer parameter *reportQuantity* configured for that *CSI-ReportConfig*.  - The UE shall derive the CSI parameters other than CRI(s) conditioned on the reported CRI(s), as follows:  - if a sub-configuration is configured with [*nzp-CSI-RS-resourceList*] and contains more than one NZP CSI-RS resource for channel measurement, the CRI corresponds to the configured -th entry of the associated CSI-RS resources in the corresponding list of NZP CSI-RS resources for channel measurement. The -th CSI-RS resource in the list is -th CSI-RS resource in the CSI-RS Resource set and corresponds to the configured -th entry of the associated corresponding CSI-IM Resource Set. - if a sub-configuration is not configured with [*nzp-CSI-RS-resourceList*], and resources for channel measurement are configured within the *NZP-CSI-RS-ResourceSet* , the CRI corresponds to the configured -th entry of the associated CSI-RS resources in the corresponding CSI-RS Resource set for channel measurement, and -th entry of the associated corresponding CSI-IM Resource Set.  <Unrelated part omitted>  ---------------------------------------------------- End of the TP for TS38.214------------------------------------------ |

TP#2 from Docomo

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| **5.2.1.4.2 Report Quantity Configurations [38.214]**  <omitted text>  If the UE is configured with a *CSI-ReportConfig* with the higher layer parameter *reportQuantity* set to 'cri-RSRP', 'cri-RI-PMI-CQI ', 'cri-RI-i1', 'cri-RI-i1-CQI', 'cri-RI-CQI', 'cri-RI-LI-PMI-CQI', 'cri-SINR', or 'cri-SINR-Capability[Set]Index ', and resources are configured in the corresponding resource set for channel measurement, then the UE shall derive the CSI parameters other than CRI conditioned on the reported CRI, where CRI *k* (*k* ≥ 0) corresponds to the configured (*k*+1)-th entry of associated *nzp-CSI-RS-Resources* in the corresponding *NZP-CSI-RS-ResourceSet* for channel measurement or *if applicable,* (*k*+1)-th entry of associated list of NZP CSI-RS resource(s) in *csi-ReportSubConfig*, and (*k*+1)-th entry of associated *csi-IM-Resource* in the corresponding *csi-IM-ResourceSet* (if configured) or (*k*+1)-th entry of associated *nzp-CSI-RS-Resources* in the corresponding *NZP-CSI-RS-ResourceSet* (if configured for *CSI-ReportConfig* with *reportQuantity* set to 'cri-SINR' or 'cri-SINR-Capability[Set]Index ') for interference measurement. If CSI-RS resources are configured, each resource shall contain at most 16 CSI-RS ports. If CSI-RS resources are configured, each resource shall contain at most 8 CSI-RS ports.  <omitted text> |

TP#3 from Samsung

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| **TP for TS 38.214 Clause 5.2.1.4.2 Report Quantity Configurations**  <omitted texts>  If the UE is configured with a *CSI-ReportConfig* that contains a list of sub-configurations, provided by the higher layer parameter [*csi-ReportSubConfigList]*:  - the UE expects to be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'. If the UE indicates a capability for supporting mixed codebook combination in a slot with [ABC], each sub-configuration can be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'.  - Each sub-configuration can be configured with an antenna port subset using the higher layer bitmap parameter [*port-subsetIndicator*] which contains the bit sequence , where is the MSB and is the LSB, bit corresponds to antenna port , and is the number of ports *nrofPorts* configured for the CSI-RS resources(s) within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement that corresponds to the *CSI-ReportConfig*. A bit value 0 in [*port-subsetIndicator*] indicates that the corresponding antenna port is disabled for the sub-configuration, whereas bit value 1 indicates that the antenna port is enabled and belongs to the antenna port subset for the sub-configuration.  - If a sub-configuration is configured with an antenna port subset, then the sub-configuration can be configured with a [RI restriction parameter] and, if the number of antenna ports of the subset greater than 2, with [*n1-n2* parameter] if the higher layer parameter *codebookType* is set to 'typeI-SinglePanel' or with [*ng*-*n1-n2* parameter] if the higher layer parameter *codebookType* is set to 'typeI-MultiPanel', and, if the corresponding number of antenna ports of the subset is 2, with *twoTX-CodebookSubsetRestriction*, where the parameters [RI restriction], [*n1-n2],* [*ng*-*n1-n2],* *twoTX-CodebookSubsetRestriction* are as described in Clauses 5.2.2.2.1 and 5.2.2.2.2.  - A sub-configuration can be configured with a list of NZP CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*], which indicates one or more NZP CSI-RS resources, within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement which corresponds to the *CSI-ReportConfig.*  [The list of NZP CSI-RS resources is identical to or has no intersection with a list of NZP CSI-RS resources configured for any other sub-configuration(s) within the *CSI-ReportConfig*.]  - If a sub-configuration is configured with a list of NZP CSI-RS resources with more than one resources, the UE shall derive the CSI parameters other than CRI conditioned on the reported CRI, where the CRI k (k ≥ 0) for the sub-configuration corresponds to the configured (k+1)-th entry of associated nzp-CSI-RS-Resources indicated by the list in the corresponding NZP-CSI-RS-ResourceSet for channel measurement.  - A sub-configuration can be configured with a power offset provided by [*powerOffse*t].  - If a sub-configurations is not configured with [*nzp-CSI-RS-resourceList*] then the sub-configuration shall be associated with all the NZP CSI-RS resources within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement which corresponds to the *CSI-ReportConfig.*  - the UE reports CSI(s) for one or more sub-configurations according to Clauses 5.2.1.5.1, 5.2.1.5.2, 5.2.3 and 5.2.4, and according to the higher layer parameter *reportQuantity* configured for that *CSI-ReportConfig*.  <omitted texts> |

**Issue 9**

TP#1 from Fujitsu

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| * **Reason for changes**   Regarding the re-indexing for CQI calculation for type 1 SD adaptation, the similar description as PMI is also needed, and only the port indication [3000, …, 3000 +*P*-1]*T* is sufficient.   * **Summary of changes**   Add re-indexing for CQI calculation for type 1 SD adaptation.  Replace the port indication [3000, …, 3000 + *p*(*P* – 1)]*T* with [3000, …, 3000 +*P*-1]*T*   * **Consequences if not approved.**   There is no description on re-indexing for CQI calculation for type 1 SD adaptation. Furthermore, it is redundant with *p*(*j*).  ---------------------------------------------------- Start of the TP for TS38.214-------------------------------------------  **5.2.2.5 CSI reference resource definition**  <Unrelated part omitted>  For a UE configured with a *CSI-ReportConfig* that contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*],  - if a sub-configuration indicates a CSI-RS antenna port subset using the higher layer bitmap parameter [*port-subsetIndicator*], as described in clause 5.2.1.4.2, for CQI calculation, antenna ports corresponding to all bits with value of 1 in [*port-subsetIndicator*] are mapped to consecutive antenna ports starting at CSI-RS antenna port 3000 in increasing order of the bit position in [*port-subsetIndicator*]. ~~for the sub-configuration with the antenna port subset represented by vector [3000 +~~ *~~p~~*~~(~~*~~0~~*~~)~~~~, …, 3000 +~~*~~P~~*~~-1~~ *~~p~~*~~(~~*~~P~~* ~~– 1)~~~~]~~*~~T~~* ~~of size~~ *~~P~~*~~, where~~ *~~P~~* ~~corresponds to the number of bits with value 1 in the bitmap [~~*~~port-subsetIndicator~~*~~]~~, the UE should assume that PDSCH signals on antenna ports in the set [1000,…, 1000+ν-1] for ν layers would result in signals equivalent to corresponding symbols transmitted on antenna ports [3000 ~~+~~ *~~p~~*~~(~~*~~0~~*~~)~~, …, 3000 +*P*-1*~~p~~*~~(~~*~~P~~* ~~– 1)~~]*T*, where *P* corresponds to the number of bits with value 1 in the bitmap [*port-subsetIndicator*],as given by  where *~~p~~*~~(~~*~~j~~*~~)~~ ~~corresponds to the~~ *~~j~~*~~-th enabled port in the bitmap [~~*~~port-subsetIndicator~~*~~], with~~ *~~p~~*~~(~~*~~j~~*~~)~~~~<~~ *~~p~~*~~(~~*~~j+1~~*~~)~~~~,~~ *~~j~~* ~~=0, …,~~ *~~P-1~~*~~, and~~ *T* , and are as previously described in this Clause, and the corresponding PDSCH EPRE to CSI-RS EPRE is as previously defined in this Clause if the sub-configuration does not indicate a power offset *[powerOffset]*.  <Unrelated part omitted>  ---------------------------------------------------- End of the TP for TS38.214---------------------------------- |

TP#2 from Apple

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| **Reason for change:** The current spec supports re-indexing of ports for PMI derivation, while ports are not re-indexed for CQI derivation. |
| **Summary of change:** CSI-RS ports for CSI report having sub-configuration including port subset indication, are reindexed for CQI derivation |
| **Consequences if not approved:**Does not follow RAN1 agreement. |
| -----------------------------------------------------------Text proposal -----------------------------------------------------------  TS38.214  5.2.2.5 CSI reference resource definition  <Unchanged parts omitted>  If configured to report CQI index, in the CSI reference resource, the UE shall assume the following for the purpose of deriving the CQI index, and if also configured, for deriving PMI and RI:  - ...  - For a UE configured with a *CSI-ReportConfig* that contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*],  - if a sub-configuration indicates a CSI-RS antenna port subset using the higher layer bitmap parameter [*port-subsetIndicator*], as described in clause 5.2.1.4.2, for CQI calculation, antenna ports corresponding to all bits with value of 1 in [*port-subsetIndicator*] are mapped to consecutive antenna ports starting at CSI-RS antenna port 3000 in increasing order of the bit position in [*port-subsetIndicator*],  ~~for the sub-configuration with the antenna port subset represented by vector [3000 +~~ *~~p~~*~~(~~*~~0~~*~~)~~~~, …, 3000 +~~ *~~p~~*~~(~~*~~P~~* ~~– 1)~~~~]~~*~~T~~* ~~of size~~ *~~P~~*~~, where~~ *~~P~~* ~~corresponds to the number of bits with value 1 in the bitmap [~~*~~port-subsetIndicator~~*~~],~~ the UE should assume that PDSCH signals on antenna ports in the set [1000,…, 1000+ν-1] for ν layers would result in signals equivalent to corresponding symbols transmitted on antenna ports [3000 ~~+~~ *~~p~~*~~(~~*~~0~~*~~)~~, …, 3000 + *P-1* *~~p~~*~~(~~*~~P~~* ~~– 1)~~] *T*, as given by  where *~~p~~*~~(~~*~~j~~*~~)~~ ~~corresponds to the~~ *~~j~~*~~-th enabled port in the bitmap [~~*~~port-subsetIndicator~~*~~], with~~ *~~p~~*~~(~~*~~j~~*~~)~~~~<~~ *~~p~~*~~(~~*~~j+1~~*~~)~~~~,~~ *~~j~~* ~~=0, …,~~ *~~P-1~~*~~,~~ *P* corresponds to the number of bits with value 1 in the bitmap [*port-subsetIndicator*] and *T* , and are as previously described in this Clause, and the corresponding PDSCH EPRE to CSI-RS EPRE is as previously defined in this Clause if the sub-configuration does not indicate a power offset *[powerOffset]*.  - if a sub-configuration indicates a list of NZP CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*] and does not indicate a power offset *[powerOffset]*, for CQI calculation for the sub-configuration the UE follows the procedure previously described in this Clause.  - if a sub-configuration indicates a power offset *[powerOffset]*,for CQI calculation, the UE shall assume the corresponding PDSCH signals transmitted on the antenna ports of a CSI-RS resource would have a ratio of EPRE to CSI-RS EPRE equal to the [difference] between *powerControlOffset* of the CSI-RS resource, given in Clause 5.2.2.3.1, and *[powerOffset]* [, where the differenceis expected to take one of the values that can be configured for *powerControlOffset* of the CSI-RS resource, given in Clause 5.2.2.3.1, and is also expected to take a value that is no larger than the value of *powerControlOffset*]*.*  <Unchanged parts omitted>  -------------------------------------------------------End of Text proposal ------------------------------------------------------ |

TP#3 from Ericsson

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| * Reason for changes   + RAN1 agreement on re-indexing of CSI-RS ports is not fully implemented for CSI quantities other than PMI * Summary of changes   + Fully implement RAN1 agreement on re-indexing of CSI-RS ports such that re-indexing consistently applied for derivation of all CSI quantities, not just PMI * Consequences if not approved   + Ambiguity in CSI-RS port numbering for some CSI quantities   ----------------------------------------- Text Proposal (TP#4) for 38.214, Sections 5.2.2.5.1 ---------------------------------  5.2.2.5.1 UE assumptions for CQI/PMI/RI calculation  If configured to report CQI index, in the CSI reference resource, the UE shall assume the following for the purpose of deriving the CQI index, and if also configured, for deriving PMI and RI:  - The first 2 OFDM symbols are occupied by control signaling.  - The number of PDSCH and DM-RS symbols is equal to 12.  - The same bandwidth part subcarrier spacing configured as for the PDSCH reception  - The bandwidth as configured for the corresponding CQI report.  - The IAB-MT shall only assume the frequency resources as indicated by the DL TX power adjustment MAC CE, if indicated for the slot of the CSI reference resource by DL Tx Power Adjustment MAC CE as described in [10, TS 38.321].  - The reference resource uses the CP length and subcarrier spacing configured for PDSCH reception  - No resource elements used by primary or secondary synchronization signals or PBCH.  - Redundancy Version 0.  - The ratio of PDSCH EPRE to CSI-RS EPRE is as given in Clause 5.2.2.3.1.  - In addition, the IAB-MT shall apply the provided DL TX power adjustment, if indicated for the slot of the CSI reference resource by DL Tx Power Adjustment MAC CE as described in [10, TS 38.321].  - Assume no REs allocated for NZP CSI-RS and ZP CSI-RS.  - Assume the same number of front-loaded DM-RS symbols as the maximum front-loaded symbols configured by the higher layer parameter *maxLength* in *DMRS-DownlinkConfig.*  - Assume the same number of additional DM-RS symbols as the additional symbols configured by the higher layer parameter *dmrs-AdditionalPosition*.  - Assume the PDSCH symbols are not containing DM-RS.  - Assume PRB bundling size of 2 PRBs.  - The PDSCH transmission scheme where the UE may assume that PDSCH transmission would be performed with up to 8 transmission layers as defined in Clause 7.3.1.4 of [4, TS 38.211]. For CQI calculation, the UE should assume that PDSCH signals on antenna ports in the set [1000,…, 1000+ν-1] for ν layers would result in signals equivalent to corresponding symbols transmitted on antenna ports [3000,…, 3000+*P*-1], as given by    where  is a vector of PDSCH symbols from the layer mapping defined in Clause 7.3.1.4 of [4, TS 38.211],  is the number of CSI-RS ports. If only one CSI-RS port is configured, *W(i)* is 1. If the higher layer parameter *reportQuantity* in *CSI-ReportConfig* for which the CQI is reported is set to either 'cri-RI-PMI-CQI' or 'cri-RI-LI-PMI-CQI', *W(i)* is the precoding matrix corresponding to the reported PMI applicable to *x(i)*. If the higher layer parameter *reportQuantity* in *CSI-ReportConfig* for which the CQI is reported is set to 'cri-RI-CQI', *W(i)* is the precoding matrix corresponding to the procedure described in Clause 5.2.1.4.2. If the higher layer parameter *reportQuantity* in *CSI-ReportConfig* for which the CQI is reported is set to 'cri-RI-i1-CQI', *W(i)* is the precoding matrix corresponding to the reported i1 according to the procedure described in Clause 5.2.1.4.2. The corresponding PDSCH signals transmitted on antenna ports [3000,…,3000 + *P* - 1] would have a ratio of EPRE to CSI-RS EPRE equal to the ratio given in Clause 5.2.2.3.1.  - For a UE configured with a *CSI-ReportConfig* that contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*],  - if a sub-configuration indicates a CSI-RS antenna port subset using the higher layer bitmap parameter [*port-subsetIndicator*], as described in clause 5.2.1.4.2, for CQI calculation for the sub-configuration except when the higher layer parameter *reportQuantity* is set to 'cri-RI-CQI', ~~with the antenna port subset represented by vector [3000 +~~ *~~p~~*~~(~~*~~0~~*~~)~~~~, …, 3000 +~~ *~~p~~*~~(~~*~~P~~* ~~– 1)~~~~]~~*~~T~~* ~~of size~~ *~~P~~*~~, where~~ *~~P~~* ~~corresponds to the number of bits with value 1 in the bitmap [~~*~~port-subsetIndicator~~*~~]~~, the UE should assume that PDSCH signals on antenna ports in the set [1000,…, 1000+ν-1] for ν layers would result in signals equivalent to corresponding symbols transmitted on antenna ports [3000 ~~+~~ *~~p~~*~~(~~*~~0~~*~~)~~, …, 3000 + *P* – 1*~~p~~*~~(~~*~~P~~* ~~– 1)~~] *T*, as given by  where *P* corresponds to the number of bits with value 1 in the bitmap [*port-subsetIndicator*] *~~p~~*~~(~~*~~j~~*~~)~~ ~~corresponds to the~~ *~~j~~*~~-th enabled port in the bitmap [~~*~~port-subsetIndicator~~*~~], with~~ *~~p~~*~~(~~*~~j~~*~~)~~~~<~~ *~~p~~*~~(~~*~~j+1~~*~~)~~~~,~~ *~~j~~* ~~=0, …,~~ *~~P-1~~*, and*T* , and are as previously described in this Clause, and the corresponding PDSCH EPRE to CSI-RS EPRE is as previously defined in this Clause if the sub-configuration does not indicate a power offset *[powerOffset]*.  - if a sub-configuration indicates a list of NZP CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*] and does not indicate a power offset *[powerOffset]*, for CQI calculation for the sub-configuration the UE follows the procedure previously described in this Clause.  - if a sub-configuration indicates a power offset *[powerOffset]*,for CQI calculation, the UE shall assume the corresponding PDSCH signals transmitted on the antenna ports of a CSI-RS resource would have a ratio of EPRE to CSI-RS EPRE equal to the difference between *powerControlOffset* of the CSI-RS resource, given in Clause 5.2.2.3.1, and *[powerOffset]*, where the differenceis expected to take one of the values that can be configured for *powerControlOffset* of the CSI-RS resource, given in Clause 5.2.2.3.1, and is also expected to take a value that is no larger than the value of *powerControlOffset.*  \*\*\* Unchanged text omitted \*\*\*  ----------------------------------------------------------- End Text Proposal ---------------------------------------------------------- |

**Issue 10**

TP#1 from Fujitsu

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| * **Reason for changes**   Report quantities of 'cri-RSRP-Index' or 'none' are also relevant to beam management and not useful to NES.   * **Summary of changes**   Report quantities of 'cri-RSRP-Index' or 'none' are NOT applicable to NES.   * **Consequences if not approved**   Infeasible configuration for NES if report quantity set to 'cri-RSRP-Index' or 'none'.  ---------------------------------------------------- Start of the TP for TS38.214-------------------------------------------  **5.2.1.4.2 Report Quantity Configurations**  <Unrelated part omitted>  If the UE is configured with a *CSI-ReportConfig* that contains a list of sub-configurations, provided by the higher layer parameter [*csi-ReportSubConfigList]*:  - The UE does not expect the higher layer parameter reportQuantity to be set to 'cri-RSRP', 'cri-SINR', ~~or~~ 'cri-SINR- Index', 'cri-RSRP- Index' or 'none'.  <Unrelated part omitted>  ---------------------------------------------------- End of the TP for TS38.214------------------------------------------ |

TP#2 from Google

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| 5.2.1.4.2 Report quantity configurations <omitted text>  If the UE is configured with a *CSI-ReportConfig* that contains a list of sub-configurations, provided by the higher layer parameter [*csi-ReportSubConfigList]*:  - The UE expects to be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'. If the UE indicates a capability for supporting mixed codebook combination in a slot with [ABC], each sub-configuration can be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'.  - Each sub-configuration can be configured with an antenna port subset using the higher layer bitmap parameter [*port-subsetIndicator*] which contains the bit sequence , where is the MSB and is the LSB, bit corresponds to antenna port , and is the number of ports *nrofPorts* configured for the CSI-RS resources(s) within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement that corresponds to the *CSI-ReportConfig*. A bit value 0 in [*port-subsetIndicator*] indicates that the corresponding antenna port is disabled for the sub-configuration, whereas bit value 1 indicates that the antenna port is enabled and belongs to the antenna port subset for the sub-configuration. For the derivation of PMI, antenna ports corresponding to all bits with value of 1 in [*port-subsetIndicator*] are mapped to consecutive antenna ports starting at CSI-RS antenna port 3000 in increasing order of the bit position in [*port-subsetIndicator*].  - If a sub-configuration is configured with an antenna port subset, then the sub-configuration can be configured with a [RI restriction parameter] and, if the number of antenna ports of the subset greater than 2, with [*n1-n2* parameter] if the higher layer parameter *codebookType* is set to 'typeI-SinglePanel' or with [*ng*-*n1-n2* parameter] if the higher layer parameter *codebookType* is set to 'typeI-MultiPanel', and, if the corresponding number of antenna ports of the subset is 2, with *twoTX-CodebookSubsetRestriction*, where the parameters [RI restriction], [*n1-n2],* [*ng*-*n1-n2],* *twoTX-CodebookSubsetRestriction* are as described in Clauses 5.2.2.2.1 and 5.2.2.2.2.  - A sub-configuration can be configured with a list of NZP CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*], which indicates one or more NZP CSI-RS resources, within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement which corresponds to the *CSI-ReportConfig.*  [The list of NZP CSI-RS resources is identical to or has no intersection with a list of NZP CSI-RS resources configured for any other sub-configuration(s) within the *CSI-ReportConfig*.]  - A sub-configuration can be configured with a power offset provided by [*powerOffse*t].  - If a sub-configurations is not configured with [*nzp-CSI-RS-resourceList*] then the sub-configuration shall be associated with all the NZP CSI-RS resources within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement which corresponds to the *CSI-ReportConfig.*  - the UE reports CSI(s) for one or more sub-configurations according to Clauses 5.2.1.5.1, 5.2.1.5.2, 5.2.3 and 5.2.4, and according to the higher layer parameter *reportQuantity* configured for that *CSI-ReportConfig*.  - The UE does not expect the higher layer parameter *reportQuantity* to be set to ‘tdcp’, ‘cri-RSRP’, ‘cri-SINR’, or ‘cri-SINR- Index'. |

TP#3 from Apple

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| **Reason for change:** The current spec only lists three report quantities that UE does not expect to be configured. |
| **Summary of change:** Include all the report quantities that UE does not expect to be configured for NES when UE is configured with sub-configurations |
| **Consequences if not approved:**Unnecessarily assumes that 'none', 'ssb-Index-RSRP', 'ssb-Index-SINR', 'cri-RSRP- Index', 'ssb-Index-RSRP- Index', 'cri-SINR- Index', 'ssb-Index-SINR- Index' or 'tdcp'. can be configured for NES when UE is configured with sub-configurations |
| -----------------------------------------------------------Text proposal -----------------------------------------------------------  TS 38.214 5.2.1.4.2 Report Quantity Configurations <Unchanged parts omitted>  If the UE is configured with a *CSI-ReportConfig* that contains a list of sub-configurations, provided by the higher layer parameter [*csi-ReportSubConfigList]*:  ......  - The UE does not expect the higher layer parameter *reportQuantity* to be set to ‘cri-RSRP’, ‘cri-SINR’, or ‘cri-SINR-Index', 'cri-RSRP-Index', 'none', 'ssb-Index-RSRP', 'ssb-Index-SINR', 'ssb-Index-RSRP- Index', 'ssb-Index-SINR- Index' or 'tdcp'.  <Unchanged parts omitted>  -------------------------------------------------------End of Text proposal ------------------------------------------------------ |

**Issue 11**

TP#1 from vivo

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| * Reason for changes   + Further clarify the CPU occupation time if a CSI report configured with a list of sub-configurations. * Summary of changes   + For P CSI reporting, CPU occupies from the first symbol of the earliest RS resource within all configured sub-configurations.   + For SP CSI report on PUSCH (excluding an initial semi-persistent CSI report on PUSCH after the PDCCH triggering the report) or semi-persistent CSI report on PUCCH, CPU occupies from the first symbol of the earliest RS resource within all triggered sub-configurations. * Consequences if not approved   + CPU occupation time is unclear if a CSI report configured with a list of sub-configurations. * Text proposal for CPU occupation time is shown in the following.  |  | | --- | | **TS 38.214 V18.0.0**  5.2.1.6 CSI processing criteria  \*\*\* Unchanged text is omitted \*\*\*  For a CSI report with CSI-ReportConfig with higher layer parameter reportQuantity not set to 'none', the CPU(s) are occupied for a number of OFDM symbols as follows:  - A periodic or semi-persistent CSI report (excluding an initial semi-persistent CSI report on PUSCH after the PDCCH triggering the report) occupies CPU(s) from the first symbol of the earliest one of each CSI-RS/CSI-IM/SSB resource for channel or interference measurement, respective latest CSI-RS/CSI-IM/SSB occasion no later than the corresponding CSI reference resource, until the last symbol of the configured PUSCH/PUCCH carrying the report.  - An aperiodic CSI report occupies CPU(s) from the first symbol after the PDCCH triggering the CSI report until the last symbol of the scheduled PUSCH carrying the report. When the PDCCH reception includes two PDCCH candidates from two respective search space sets, as described in clause 10.1 of [6, TS 38.213], for the purpose of determining the CPU occupation duration, the PDCCH candidate that ends later in time is used.  - An initial semi-persistent CSI report on PUSCH after the PDCCH trigger occupies CPU(s) from the first symbol after the PDCCH until the last symbol of the scheduled PUSCH carrying the report. When the PDCCH reception includes two PDCCH candidates from two respective search space sets, as described in clause 10.1 of [6, TS 38.213], for the purpose of determining the CPU occupation duration, the PDCCH candidate that ends later in time is used.  For a CSI report configured with a list of *csi-ReportSubConfigs* with higher layer parameter *reportQuantity* in *CSI-ReportConfig* not set to 'none', the CPU(s) are occupied for a number of OFDM symbols as follows:  - A periodic sub-config CSI report occupies CPU(s) from the first symbol of the earliest RS resource for channel or interference measurement within **all configured sub-configurations**, until the last symbol of the configured PUSCH/PUCCH carrying the report.  - A semi-persistent CSI report on PUSCH (excluding an initial semi-persistent CSI report on PUSCH after the PDCCH triggering the report) or semi-persistent CSI report on PUCCH occupies CPU(s) from the first symbol of the earliest one of each CSI-RS/CSI-IM/SSB resource for channel or interference measurement **among the triggered sub-configurations**, respective latest CSI-RS/CSI-IM/SSB occasion no later than the corresponding CSI reference resource, until the last symbol of the configured PUSCH/PUCCH carrying the report. | |

TP#2 from Docomo

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| **5.2.1.6 CSI processing criteria [38.214]**  For a CSI report with *CSI-ReportConfig* with higher layer parameter *reportQuantity* not set to 'none', the CPU(s) are occupied for a number of OFDM symbols as follows:  - A periodic or semi-persistent CSI report (excluding an initial semi-persistent CSI report on PUSCH after the PDCCH triggering the report) for the CSI report configuration without *csi-ReportSubConfig*, occupies CPU(s) from the first symbol of the earliest one of each CSI-RS/CSI-IM/SSB resource for channel or interference measurement, respective latest CSI-RS/CSI-IM/SSB occasion no later than the corresponding CSI reference resource, until the last symbol of the configured PUSCH/PUCCH carrying the report.  - A periodic or semi-persistent CSI report (excluding an initial semi-persistent CSI report on PUSCH after the PDCCH triggering the report) for the CSI report configuration with *csi-ReportSubConfig*, occupies CPU(s) from the first symbol of the earliest one of each CSI-RS/CSI-IM/SSB resource for channel or interference measurement of reported *csi-ReportSubConfig*, respective latest CSI-RS/CSI-IM/SSB occasion no later than the corresponding CSI reference resource, until the last symbol of the configured PUSCH/PUCCH carrying the report.  - An aperiodic CSI report occupies CPU(s) from the first symbol after the PDCCH triggering the CSI report until the last symbol of the scheduled PUSCH carrying the report. When the PDCCH reception includes two PDCCH candidates from two respective search space sets, as described in clause 10.1 of [6, TS 38.213], for the purpose of determining the CPU occupation duration, the PDCCH candidate that ends later in time is used.  - An initial semi-persistent CSI report on PUSCH after the PDCCH trigger occupies CPU(s) from the first symbol after the PDCCH until the last symbol of the scheduled PUSCH carrying the report. When the PDCCH reception includes two PDCCH candidates from two respective search space sets, as described in clause 10.1 of [6, TS 38.213], for the purpose of determining the CPU occupation duration, the PDCCH candidate that ends later in time is used. |

TP#3 from Samsung

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| **TP for TS 38.214 Clause 5.2.1.6 CSI processing criteria**  <omitted texts>  For a CSI report with *CSI-ReportConfig* with higher layer parameter *reportQuantity* not set to 'none', the CPU(s) are occupied for a number of OFDM symbols as follows:  - A periodic or semi-persistent CSI report (excluding an initial semi-persistent CSI report on PUSCH after the PDCCH triggering the report) occupies CPU(s) from the first symbol of the earliest one of each CSI-RS/CSI-IM/SSB resource for channel or interference measurement, respective latest CSI-RS/CSI-IM/SSB occasion no later than the corresponding CSI reference resource, until the last symbol of the configured PUSCH/PUCCH carrying the report. For a periodic CSI report with *CSI-ReportConfig* providing a list of *L* sub-configurations, the CSI-RS/CSI-IM resource corresponds to the *L* sub-configurations provided in the *CSI-ReportConfig*. For a semi-persistent CSI report with *CSI-ReportConfig* providing a list of *L* sub-configurations, the CSI-RS/CSI-IM resource corresponds to the *N* indicated sub-configurations from the *L* sub-configurations provided in the *CSI-ReportConfig*.  <omitted texts> |

TP#4 from Samsung for CSI computation time

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| **TP for TS 38.214 Clause 5.4 UE CSI computation time**  <omitted texts>  When the *CSI request* field on a DCI triggers a CSI report(s) on PUSCH, the UE shall provide a valid CSI report for the *n*-th triggered report,  - if the first uplink symbol to carry the corresponding CSI report(s) including the effect of the timing advance, starts no earlier than at symbol *Zref*, and  - if the first uplink symbol to carry the *n*-th CSI report including the effect of the timing advance, starts no earlier than at symbol *Z'ref(n),*  where *Zref* is defined as the next uplink symbol with its CP starting  after the end of the last symbol of the PDCCH triggering the CSI report(s), and where *Z'ref(n),* is defined as the next uplink symbol with its CP starting after the end of the last symbol in time of the latest of: aperiodic CSI-RS resource for channel measurements, aperiodic CSI-IM used for interference measurements, and aperiodic NZP CSI-RS for interference measurement, when aperiodic CSI-RS is used for channel measurement for the *n*-th triggered CSI report, and where *Tswitch* is defined in clause 6.4 and is applied only if of table 5.4-1 is applied. If the *n*-th triggered report for which the *CSI-ReportConfig* containing a list of *L* sub-configurations, the aperiodic CSI-RS resource for channel measurements, aperiodic CSI-IM used for interference measurements, and aperiodic NZP CSI-RS for interference measurement corresponds to the *N* indicated sub-configurations out of *L* sub-configurations contained in the *CSI-ReportConfig*.  <omitted texts> |

**Issue 13**

TP#1 from Google

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| 5.2.1.4.2 Report quantity configurations <omitted text>  If the UE is configured with a *CSI-ReportConfig* that contains a list of sub-configurations, provided by the higher layer parameter [*csi-ReportSubConfigList]*:  - The UE expects to be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'. If the UE indicates a capability for supporting mixed codebook combination in a slot with [ABC], each sub-configuration can be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'.  - Each sub-configuration can be configured with an antenna port subset using the higher layer bitmap parameter [*port-subsetIndicator*] which contains the bit sequence , where is the MSB and is the LSB, bit corresponds to antenna port , and is the number of ports *nrofPorts* configured for the CSI-RS resources(s) within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement that corresponds to the *CSI-ReportConfig*. A bit value 0 in [*port-subsetIndicator*] indicates that the corresponding antenna port is disabled for the sub-configuration, whereas bit value 1 indicates that the antenna port is enabled and belongs to the antenna port subset for the sub-configuration. For the derivation of PMI, antenna ports corresponding to all bits with value of 1 in [*port-subsetIndicator*] are mapped to consecutive antenna ports starting at CSI-RS antenna port 3000 in increasing order of the bit position in [*port-subsetIndicator*].  - If a sub-configuration is configured with an antenna port subset, then the sub-configuration can be configured with a [RI restriction parameter] and, if the number of antenna ports of the subset greater than 2, with [*n1-n2* parameter] if the higher layer parameter *codebookType* is set to 'typeI-SinglePanel' or with [*ng*-*n1-n2* parameter] if the higher layer parameter *codebookType* is set to 'typeI-MultiPanel', and, if the corresponding number of antenna ports of the subset is 2, with *twoTX-CodebookSubsetRestriction*, where the parameters [RI restriction], [*n1-n2],* [*ng*-*n1-n2],* *twoTX-CodebookSubsetRestriction* are as described in Clauses 5.2.2.2.1 and 5.2.2.2.2.  - A sub-configuration can be configured with a list of NZP CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*], which indicates one or more NZP CSI-RS resources, within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement which corresponds to the *CSI-ReportConfig.*  [The list of NZP CSI-RS resources is identical to or has no intersection with a list of NZP CSI-RS resources configured for any other sub-configuration(s) within the *CSI-ReportConfig*.]  - A sub-configuration can be configured with a power offset provided by [*powerOffse*t].  - If a sub-configurations is not configured with [*nzp-CSI-RS-resourceList*] then the sub-configuration shall be associated with all the NZP CSI-RS resources within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement which corresponds to the *CSI-ReportConfig.*  - the UE reports CSI(s) for one or more sub-configurations according to Clauses 5.2.1.5.1, 5.2.1.5.2, 5.2.3 and 5.2.4, and according to the higher layer parameter *reportQuantity* configured for that *CSI-ReportConfig*.  - The UE does not expect the higher layer parameter *reportQuantity* to be set to ‘cri-RSRP’, ‘cri-SINR’, or ‘cri-SINR- Index'.  - The corresponding *NZP-CSI-RS-ResourceSet* for channel measurement configured in the *CSI-ReportConfig* is configured with one resource group. |

**Issue 14**

TP#1 from Google

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| 5.2.1.4.2 Report quantity configurations <omitted text>  If the UE is configured with a *CSI-ReportConfig* that contains a list of sub-configurations, provided by the higher layer parameter [*csi-ReportSubConfigList]*:  - The UE expects to be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'. If the UE indicates a capability for supporting mixed codebook combination in a slot with [ABC], each sub-configuration can be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'.  - Each sub-configuration can be configured with an antenna port subset using the higher layer bitmap parameter [*port-subsetIndicator*] which contains the bit sequence , where is the MSB and is the LSB, bit corresponds to antenna port , and is the number of ports *nrofPorts* configured for the CSI-RS resources(s) within the *nzp-CSI-RS-ResourceSetList* contained in the *CSI-ResourceConfig* for channel measurement that corresponds to the *CSI-ReportConfig*. A bit value 0 in [*port-subsetIndicator*] indicates that the corresponding antenna port is disabled for the sub-configuration, whereas bit value 1 indicates that the antenna port is enabled and belongs to the antenna port subset for the sub-configuration. For the derivation of PMI, antenna ports corresponding to all bits with value of 1 in [*port-subsetIndicator*] are mapped to consecutive antenna ports starting at CSI-RS antenna port 3000 in increasing order of the bit position in [*port-subsetIndicator*]. UE expects the same *nrofPorts* configured for the CSI-RS resources(s) within the *nzp-CSI-RS-ResourceSetList* contained in the *CSI-ResourceConfig* for channel measurement that corresponds to the *CSI-ReportConfig.*  - If a sub-configuration is configured with an antenna port subset, then the sub-configuration can be configured with a [RI restriction parameter] and, if the number of antenna ports of the subset greater than 2, with [*n1-n2* parameter] if the higher layer parameter *codebookType* is set to 'typeI-SinglePanel' or with [*ng*-*n1-n2* parameter] if the higher layer parameter *codebookType* is set to 'typeI-MultiPanel', and, if the corresponding number of antenna ports of the subset is 2, with *twoTX-CodebookSubsetRestriction*, where the parameters [RI restriction], [*n1-n2],* [*ng*-*n1-n2],* *twoTX-CodebookSubsetRestriction* are as described in Clauses 5.2.2.2.1 and 5.2.2.2.2.  - A sub-configuration can be configured with a list of NZP CSI-RS resources, provided by [*nzp-CSI-RS-resourceList*], which indicates one or more NZP CSI-RS resources, within each *NZP-CSI-RS-ResourceSet* in the *nzp-CSI-RS-ResourceSetList* contained in the *CSI-ResourceConfig* for channel measurement which corresponds to the *CSI-ReportConfig.* UE expects the same number of NZP CSI-RS resources configured in each *NZP-CSI-RS-ResourceSet* in the *nzp-CSI-RS-ResourceSetList* contained in the *CSI-ResourceConfig* for channel measurement which corresponds to the *CSI-ReportConfig.*  <omitted text> |

**Issue 15**

TP#1 from Samsung

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| **TS 38.214 Clause 5.2.2.3.1 NZP CSI-RS**  <omitted texts>  For a CSI-RS Resource Set for channel measurement configured with two Resource Groups and Resource Pairs, the slot offsets of the two resources in a Resource Pair are configured within  slots, without DL/UL switching in between the two resources, where implies that the two resources are configured in the same slot, and implies that the two resources are configured within two adjacent slots.  For a *NZP-CSI-RS-ResourceSet* for channel measurement with resources and linked to a *CSI-ReportConfig* configured with *codebookType* set to 'typeII-CJT-r18' or 'typeII-CJT-PortSelection-r18', the slot offsets of the CSI-RS resources are configured within  slots, without DL/UL switching in between the two resources, where implies that the resources are configured in the same slot, and implies that the resources are configured within two adjacent slots.  For a *NZP-CSI-RS-ResourceSet* for channel measurement with resources and linked to a *CSI-ReportConfig* that contains a list of sub-configurations and each of the sub-configuration is provided with *nzp-CSI-RS-resourceList*, the slot offsets of the CSI-RS resources are configured within  slots, without DL/UL switching in between the two resources, where implies that the resources are configured in the same slot, and implies that the resources are configured within two adjacent slots.  The bandwidth and initial common resource block (CRB) index of a CSI-RS resource within a BWP ….  <omitted texts> |

**Issue 16**

TP#1 from Lenovo

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| ***Reason for change****:* Aligning the terms across TS 38.212 and TS 38.214 corresponding to CSI associated with different sub-configurations of the CSI reporting setting |
| ***Summary of change****:* Clause 5.2.3, 5.2.4: Replacing the term “CSIs” in TS 38.214 with “CSI-sub-reports” |
| ***Consequence if not approved****:* Inconsistent specifications with unclear correspondence between CSI sub-reports in TS 38.212 and the corresponding CSI parameters referred to in TS 38.214 |
| 5.2.3 CSI reporting using PUSCH  A UE shall perform aperiodic CSI reporting using PUSCH on serving cell c upon successful decoding of a DCI format 0\_1 or DCI format 0\_2 which triggers an aperiodic CSI trigger state.  **<Unchanged text is omitted>**  When CSI reporting on PUSCH comprises two parts, the UE may omit a portion of the Part 2 CSI. Omission of Part 2 CSI is according to the priority order shown in Table 5.2.3-1, where  is the number of CSI reports configured to be carried on the PUSCH. Priority 0 is the highest priority and priority  is the lowest priority and the CSI report *n* corresponds to the CSI report with the *n*th smallest Prii,CSI(*y,k,c,s*) value among the  CSI reports as defined in Clause 5.2.5. The subbands for a given CSI report *n* indicated by the higher layer parameter *csi-ReportingBand* with value '1' are numbered continuously in increasing order with the lowest subband of *csi-ReportingBand* with value set to '1' as subband 0. When omitting Part 2 CSI information for a particular priority level, the UE shall omit all of the information at that priority level, except when the corresponding CSI Part 2 of the CSI report corresponds to multiple CSI sub-reports each of which corresponding to a sub-configuration from a list of sub-configurations contained in the *CSI-ReportConfig* as described in Clause 5.2.1.1.  **<Unchanged text is omitted>**  For a Reporting Setting for which the *CSI-ReportConfig* contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], for a corresponding CSI report which contains one or more CSI sub-reports, omission of Part 2 CSI is done at a sub-configuration level within the same priority level defined by Table 5.2.3-1 where a sub-configuration with an index, provided by [*csi-ReportSubConfigID*], with lower value has higher priority.  **<Unchanged text is omitted>**  5.2.4 CSI reporting using PUCCH  A UE is semi-statically configured by higher layers to perform periodic CSI Reporting on the PUCCH. A UE can be configured by higher layers for multiple periodic CSI Reports corresponding to multiple higher layer configured CSI Reporting Settings, where the associated CSI Resource Settings are higher layer configured.  **<Unchanged text is omitted>**  If any of the CSI reports consist of two parts, the UE may omit a portion of Part 2 CSI. Omission of Part 2 CSI is according to the priority order shown in Table 5.2.3-1. For a Reporting Setting for which the *CSI-ReportConfig* contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], for a given CSI report which contains one or more CSI sub-reports, omission of Part 2 CSI is defined in Clause 5.2.3. Part 2 CSI is omitted beginning with the lowest priority level until the Part 2 CSI code rate is less or equal to the one configured by higher layer parameter *maxCodeRate*.  **<Unchanged text is omitted>** |

TP#2 from Ericsson

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| * Reason for changes   + Terminology of CSIs between 38.214 and 38.212 is misaligned for the description of CSI Part 2 omission * Summary of changes   + Change “CSIs” in 38.214 to “CSI sub-reports” * Consequences if not approved   + Inconsistent terminology between different specifications for description of CSI Part 2 omission   -------------------------------- Text Proposal (TP#5) for 38.214, Section 5.2.3 and 5.2.4 -----------------------------------  \*\*\* Unchanged text omitted \*\*\*  5.2.3 CSI reporting using PUSCH  \*\*\* Unchanged text omitted \*\*\*  For both Type I and Type II reports configured for PUCCH but transmitted on PUSCH, the determination of the payload for CSI part 1 and CSI part 2 follows that of PUCCH as described in Clause 5.2.4.  When CSI reporting on PUSCH comprises two parts, the UE may omit a portion of the Part 2 CSI. Omission of Part 2 CSI is according to the priority order shown in Table 5.2.3-1, where  is the number of CSI reports configured to be carried on the PUSCH. Priority 0 is the highest priority and priority  is the lowest priority and the CSI report *n* corresponds to the CSI report with the *n*th smallest Prii,CSI(*y,k,c,s*) value among the  CSI reports as defined in Clause 5.2.5. The subbands for a given CSI report *n* indicated by the higher layer parameter *csi-ReportingBand* with value '1' are numbered continuously in increasing order with the lowest subband of *csi-ReportingBand* with value set to '1' as subband 0. When omitting Part 2 CSI information for a particular priority level, the UE shall omit all of the information at that priority level, except when the corresponding CSI report contains multiple ~~Part 2~~ CSI~~s~~ sub-reports with Part 2 each ~~of which~~ corresponding to a sub-configuration from a list of sub-configurations contained in the *CSI-ReportConfig* as described in Clause 5.2.1.1.  \*\*\* Unchanged text omitted \*\*\*  - For a Reporting Setting for which the *CSI-ReportConfig* contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], for a corresponding CSI report which contains one or more CSI~~s~~ sub-reports, omission of Part 2 CSI is done at a sub-configuration level within the same priority level defined by Table 5.2.3-1 where a sub-configuration with an index, provided by [*csi-ReportSubConfigID*], with lower value has higher priority.  \*\*\* Unchanged text omitted \*\*\*  5.2.4 CSI reporting using PUCCH  \*\*\* Unchanged text omitted \*\*\*  If any of the CSI reports consist of two parts, the UE may omit a portion of Part 2 CSI. Omission of Part 2 CSI is according to the priority order shown in Table 5.2.3-1. For a Reporting Setting for which the *CSI-ReportConfig* contains a list of sub-configurations provided by the higher layer parameter [*csi-ReportSubConfigList*], for a given CSI report which contains one or more CSI~~s~~ sub-reports, omission of Part 2 CSI is defined in Clause 5.2.3. Part 2 CSI is omitted beginning with the lowest priority level until the Part 2 CSI code rate is less or equal to the one configured by higher layer parameter *maxCodeRate*.  \*\*\* Unchanged text omitted \*\*\*  ----------------------------------------------------------- End Text Proposal --------------------------------------------------------- |

## B. Agreements sorted per technical issue

**NZP CSI-RS resource configuration for channel measurement**

**Agreement@112**

For the purpose of further discussions in RAN1 on NES spatial domain adaptations, consider the following cases

* Type 1: all antenna elements associated to a logical antenna port is disabled/enabled
* Type 2: part/subset of antenna elements associated to a logical antenna port is disabled/enabled

**Agreement @112bis-e**

Define necessary enhancements to support both types of spatial adaptation cases (as defined in RAN1#112) in Rel-18.

* Note: This does not imply explicit definition in specifications for adaptation types.
* Note: This does not imply explicit specification changes are made for both cases

**Agreement@112**

For spatial element adaptation, further study the following

* A1-1) Each CSI-RS resource/resource set/resource setting can be associated with only one spatial adaptation pattern
  + FFS: Details on how the association is done
* A1-2) Each CSI-RS resource/resource set/resource setting can be associated with one or more spatial adaptation patterns
  + FFS: Details on how the association is done
* FFS: Details on the definition of “spatial adaptation patterns”

**Agreement@112bis-e**

Support configurability of NZP CSI-RS resource(s) for channel measurement within one resource setting corresponding to more than one spatial adaptation patterns with at least one of the following

* A1-1-revised: a resource set with multiple resources is configured within a resource setting, where each resource is associated with only one spatial adaptation pattern
* A1-2-revised: For a resource configured in a resource set within a resource setting, the resource can be associated with more than one spatial adaptation patterns
  + One or more resources can be configured in the resource set for channel measurement.

**Agreement@112bis-e**

* + - For R18 NES, only legacy port configuration values (N1, N2) or (Ng, N1, N2) are supported.
    - FFS: Whether/what restriction for A1-1-revised and A-1-2-revised w.r.t number of ports

**Agreement@113**

* For A1-1-revised for Type 2, one or more CSI-RS resources from a CSI-RS resource set for channel measurement can be associated with the same sub-configuration provided in a CSI report configuration
  + Resources in the resource set for channel measurement have the same number of antenna ports
* For A1-2-revised for Type 1, all CSI-RS resource(s) (which can be one or more) in the CSI-RS resource set for channel measurement are associated with each sub-configuration provided in a CSI report configuration
  + i.e. each CSI-RS resource is associated with all the sub-configurations
  + Resources in the resource set for channel measurement have the same number of antenna ports
* FFS: restriction on total number of CSI-RS resources for channel measurement in a CSI-ReportConfig and/or sub-configuration.

**Working Assumption@112bis-e**

Al-1-revised and A1-2-revised are supported

* + - FFS: Which Type of SD adaptation A1-1-revised and A1-2-revised are applicable for

**Agreement@113**

Confirm the working assumption with the following update (in blue)

* + - Al-1-revised and A1-2-revised are supported
      * For Type 1 SD adaptation
        + A1-2-revised is supported
      * For Type 2 SD adaptation
        + A1-1-revised is supported.

**Conclusion@112bis-e**

New CSI-RS resource (RE mapping) pattern is not introduced for R18 network energy savings purpose.

* Note: CSI-RS resource (RE mapping) pattern above refers to a row in TS 38.211 Table 7.4.1.5.3-1 determining CSI-RS locations within a slot.

**Agreement@114bis**

Only codebook type 1 for PMI is supported for type 2 SD adaptation and PD adaptation.

**CSI report configuration including the sub-configurations**

**Agreement@112**

For spatial element adaptation, further study the following

* A2-1) Independent/separate CSI report configurations where each CSI report configuration corresponds to one spatial adaptation pattern
* A2-2) One CSI report configuration contains multiple CSI report sub-configurations where each sub-configuration corresponds to one spatial adaptation pattern
  + FFS: Details of sub-configuration

**Agreement@112**

For spatial domain adaptation, further study necessary enhancements for multiple CSI(s) where each CSI corresponds to a spatial adaptation pattern, e.g.

* FFS: gNB indicates to UE which CSI(s) the UE shall report
* FFS: the UE selects which CSI(s) are reported
* FFS: multiple CSI(s) are reported in a joint CSI report
* FFS: Overhead reduction for multiple CSI(s)

Note: UE complexity needs to be taken into account.

**Agreement@112bis-e**

At least support A2-2, i.e. one CSI report configuration contains multiple CSI report sub-configurations where each sub-configuration corresponds to one spatial adaptation pattern.

* FFS: impact on CSI processing requirement

**Agreement@112bis-e**

For CSI report configuration, if L>1 in a CSI report configuration, at least the following can be included for each sub-configuration for Type 1 SD adaptation

* N1, N2 for single-panel and N1, N2, Ng for multi-panel
  + FFS: details on explicit indication or implicit derivation
* Port subset indication when A1-2 is used (if A1-2 is supported)
  + FFS: details on explicit indication or implicit derivation
* FFS: rank restriction
* FFS: codebook subset restriction
* FFS: supported codebook types for PMI, e.g., Type-I or Type-II
* FFS: report quantity
* FFS: reportFreqConfiguration
* FFS: Group identity of NZP CSI-RS resource(s) in a resource set for channel measurement when A1-1 is used

For CSI report configuration for type 2 SD adaptation, further study under which cases sub-configurations may or may not be needed including sub-configuration content

**Agreement@113**

For a CSI report configuration with L>1, for Type 1 SD, at least when A1-2-revised is used for the associated codebook configuration,

* Only common codebook type for PMI across sub-configurations is supported
  + Codebook type-1 for PMI is supported

**Agreement@113**

For Type 1 adaptation, for each sub-configuration,

* Port subset indication is based bitmap is supported
  + - One bit per port for single panel case (i.e. turning off in a port level)
    - FFS: One bit per panel for multi-panel case (i.e. turning off in panel level)
    - Note: It is up to the gNB to ensure the mapping of the bit to a uniform x-pol rectangular array

**Agreement@113**

For Type 1 adaptation, for each sub-configuration, for multi-panel case,

* One bit per port based on bitmap is supported
* Note: It is up to the gNB to ensure the mapping of the bit to a uniform x-pol rectangular array for each of the activated panel(s). Additionally, if more than one panel is activated, uniformity across panels is ensured by the gNB (i.e., the same N1, N2 across multiple activated panels)

**Agreement@113**

For the sub-configuration(s) in a CSI report configuration with L>1,

* for Type 1 SD with A1-2-revised, the following is configured in each sub-configuration
  + - codebook subset restriction,
    - rank restriction
    - N1, N2 and Ng
    - FFS: the case when the number of ports is less than 4
* for Type 2 SD adaptation with A1-1-revised, for each sub-configuration
  + - a list of CSI-RS resource ID
    - FFS: codebookConfig (including codebookSubsetRestriction/ ri-Restriction)
    - FFS: CQI table indication
    - FFS: reportFreqConfiguration
    - FFS: report quantity

Above is agreed in addition to what was agreed in previous RAN1 agreements

**Agreement@114**

* For each sub-configuration in a CSI reportConfig, for Type 1 SD adaptation only, and Type 2 SD adaptation only, support,
  + {codebookConfig (for Type 2 SD only) is common for all sub-configurations
  + {reportQuantity, reportFreqConfiguration} is not configured in any sub-configuration and the legacy/original parameters are used for all sub-configurations.
  + cqi-Table is common for all sub-configurations
  + for indicating # of ports in a port subset = 2, legacy IE twoTX-CodebookSubsetRestriction can be used for this subConfig in Type 1 SD.

**Agreement@114**

For Type 1 SD for multi-panel case,

* Introduce a new mixed codebook combination {Type 1 Single Panel, Type 1 Multi Panel, Null} in R18 for FG *codebookComboParameterAddition* (indicating the UE supports the mixed codebook combinations in a slot)
* Note: gNB can configure either Type 1 single panel codebook or Type 1 multi-panel codebook for a sub-configuration from one or multiple sub-configurations within one CSI report configuration if a UE reports support of multi-panel operation.

**Conclusion@114**

No simultaneous configuration of Type 1 SD and Type 2 SD adaptation in a same CSI report configuration.

**CSI reporting procedures**

**(Rapporteur note: CSI reporting framework)**

**Agreement@112**

For spatial domain adaptation, further study necessary enhancements for multiple CSI(s) where each CSI corresponds to a spatial adaptation pattern, e.g.

* FFS: gNB indicates to UE which CSI(s) the UE shall report
* FFS: the UE selects which CSI(s) are reported
* FFS: multiple CSI(s) are reported in a joint CSI report
* FFS: Overhead reduction for multiple CSI(s)

Note: UE complexity needs to be taken into account.

**Agreement@112bis-e**

For a CSI report config with *L* sub-configuration(s), support a framework that enables a UE to report *N* CSI(s) in one reporting instance where the *N* CSI(s) are associated with *N* sub-configuration(s) from *L* (where ) and each CSI corresponds to one sub-configuration.

* For discussion purpose, N=1 refers to single-CSI while N>1 refers to multi-CSI.
* For Semi-persistent/Aperiodic CSI reporting, support gNB trigger/indicate/activate report of N≤L CSIs where N>=1
* The maximum value of N and L are subject to UE capability
* Further study how to address/minimize additional UE complexity

The following bullet not agreed due to objection from Apple and vivo

* For Periodic CSI reporting, at least the case of N=L is supported where N>=1

**Agreement@114bis**

From RAN1 perspective, up to 4 CSI report configurations can be configured in a BWP for SP CSI reporting on PUCCH where one or more report configurations can contain a list of sub-configuration(s)

* Send an LS to RAN2 inlcuding the relevant agreements made in UE feature discussions. Final LS is endorsed in R1-2310578.

**Conclusion@114bis**

There is no consensus on the following proposal:

For a P/SP-CSI report configuration containing a list of *L* sub-configurations, if at least one subConfig (which is the triggered one for SP-CSI reporting, or configured one for P-CSI report) is associated with more than one CSI-RS resource, nCSI\_ref is the smallest value >=5\*2μDL; otherwise, it is the smallest value no smaller than 4\*2μDL

**Agreement@114bis**

For CSI reporting on PUCCH and PUSCH, at least one new table is introduced for the scenarios of Table 6.3.1.1.2-11 and Table 6.3.2.1.2-5 in TS38.212, with update corresponding to the CSI mapping order of part 2 CSI even/odd subbands for CSI reporting corresponding to one or more sub-configurations.

**Agreement@114bis**

Adopt the following TP for TS 38.213.

---------------------------------Start of Text Proposal on TS 38.213 v18.0.0------------------

**9.2.5 UE procedure for reporting multiple UCI types**

< Unchanged parts are omitted >

If a UE would multiplex CSI reports that include Part 2 CSI reports in a PUCCH resource, the UE determines the PUCCH resource and a number of PRBs for the PUCCH resource or a number of Part 2 CSI reports assuming that each of the CSI reports indicates rank 1, or rank combination of {1, 1}, or rank 1 per CSI sub-report, if applicable. If the higher layer parameter *csi-ReportMode* of CSI reports is set to 'Mode2', the UE determines the PUCCH resource and a number of PRBs for the PUCCH resource or a number of Part 2 CSI reports assuming that each CRI in the CSI report is associated with a resource pair.

< Unchanged parts are omitted >

---------------------------------End of Text Proposal on TS 38.213 v18.0.0--------------------

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| Reason for changes | Clarify the rank assumption for determination of PUCCH resource. |
| Summary of changes | Added the assumed rank for CSI sub-report. |
| Consequences if not approved | Unclear rank assumption when PUCCH resource is to be determined. |
| Note: this table is added by Rapporteur | |

**(Rapporteur note: CSI payload/reportQuantity, UCI mapping)**

**Agreement@112bis-e**

* For CSI feedback with CSI overhead/report payload reduction, further study whether/how to report a common value and/or a differential and/or joint coded value across same CSI quantity of different sub-configurations/adaptation patterns, at least for the following
  + CRI
  + RI
  + PMI
  + CQI
  + FFS: L1-RSRP
  + Other (new) report quantity, if any
* Further study whether/how it is feasible/possible for the UE to skip the evaluations of some sub-configurations/adaptation patterns to reduce the burden at the UE

**Agreement@113**

For both spatial domain NES, when UE reports CSIs corresponding to one or more sub-configurations provided in a CSI report configuration,

* At least support baseline: Report CSI for each indicated sub-configuration, according to reportQuantity configuration
  1. FFS: details on how to map CSI(s) in a CSI report
* Further enhancement on CSI payload reduction is not precluded

**Conclusion@114**

* No further enhancements for PMI reduction in R18 NES.
* No further enhancements for RI reduction in R18 NES.
* No support of UE reporting PDSCH power reduction tolerance in R18 NES.

**Agreement@114bis**

Support gNB can configure report quantities of 'cri-RI-i1-CQI', 'cri-RI-CQI', or 'cri-RI-i1'.

**Agreement@114bis**

Report quantities of 'cri-RSRP', 'cri-SINR', or 'cri-SINR- Index ' are NOT applicable to NES

**Conclusion@114bis**

There is no consensus to support the following:

* A UE only reports PMI in CSI part 2 for the first sub-configuration among the sub-configurations with the same RI reported across sub-configurations.

**Agreement@114**

Down-select from the below for priority rule determination for CSI reporting of multiple sub-configurations

* Option 1: The priority of the CSI report containing CSIs for multiple sub-configurations, is determined according to the clause 5.2.5 of TS 38.214.
  + 1-b) A sub-configuration level priority is determined by the order of sub-configuration index. For Part 2 CSI corresponding to each sub-configuration, omission is at subConfig level. Follow legacy dropping rules for a CSI report containing multiple CSIs.
    - CSI mapping rule across sub-configurations follow legacy specification principle
    - Sub-configuration index with lower value has higher priority
    - Sub-configuration index is configured in CSI report config

**Agreement@114**

For CSIs across multiple sub-configurations in one CSI reportConfig map different sub-configurations based on RAN1#114 agreement in 9.7.1

* For Part 2 priority reporting level
  + Option 1: for a given band type from {wideband, even subband, odd subband}, the omission order follows the priority order determined by sub-configuration index

**Agreement@114**

For N(>1) CSIs reporting with multiple sub-configurations without payload/complexity reduction,

* Each CSI can be a single-part, or two-part CSI, and contains the same types of CSI parameters/quantities as legacy, when applicable/if reported;
* The mapping order of CSI fields of one sub-configuration is as legacy mapping order of CSI fields of one CSI report;
* Part 2 CSI priority reporting level follows wideband CSI first, then even subband CSI and odd subband CSI;

**Agreement@114bis**

For CSI mapping of subbands for a CSI report having multiple sub-configurations, odd sub-band CSI(s) of all sub-configurations in one multi-CSI reporting are mapped after all even sub-band CSI(s) in one multi-CSI reporting.



**Conclusion@114bis**

No consensus to have spec update with respect to the issue 6 in R1-2310307.

**Agreement@114bis**

For a CSI report having sub-configuration including port subset indication, CSI-RS port re-indexing is supported.

**Agreement@114bis**

Adopt the following TP for TS 38.214 for the above agreements

**5.2.1.4.2 Report Quantity Configurations**

---------------------------------------------------- Unchanged text is omitted ---------------------------------------------------------

If the UE is configured with a *CSI-ReportConfig* that contains a list of sub-configurations, provided by the higher layer parameter [*csi-ReportSubConfigList]*:

* ~~t~~The UE expects to be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'. If the UE indicates a capability for supporting mixed codebook combination in a slot with [ABC], each sub-configuration can be configured with the higher layer parameter *codebookType* set to 'typeI-SinglePanel' or 'typeI-MultiPanel'.
* ~~-~~ Each sub-configuration can be configured with an antenna port subset using the higher layer bitmap parameter [*port-subsetIndicator*] which contains the bit sequence , where is the MSB and is the LSB, bit corresponds to antenna port , and is the number of ports *nrofPorts* configured for the CSI-RS resources(s) within the *NZP-CSI-RS-ResourceSet* contained in the *CSI-ResourceConfig* for channel measurement that corresponds to the *CSI-ReportConfig*. A bit value 0 in [*port-subsetIndicator*] indicates that the corresponding antenna port is disabled for the sub-configuration, whereas bit value 1 indicates that the antenna port is enabled and belongs to the antenna port subset for the sub-configuration. For the derivation of PMI, antenna ports corresponding to all bits with value of 1 in [*port-subsetIndicator*] are mapped to consecutive antenna ports starting at CSI-RS antenna port 3000 in increasing order of the bit position in [*port-subsetIndicator*].



---------------------------------------------------- Unchanged text is omitted -------------------------------------------------------

|  |  |
| --- | --- |
| Reason for changes | To enable contiguous antenna port indexing for PMI derivation for Type 1 SD with port subset indication. |
| Summary of changes | Port re-indexing procedure is added. |
| Consequences if not approved | Antenna port will be non-consecutive which cause misalignment for PMI derivation. |
| Note: this table is added by Rapporteur | |

**Agreement@114bis**

* Reason for changes
  + Current text incorrectly implies that all CSI reports contain sub-reports
  + Variable used for number of CSI sub-reports is incorrect
  + Current text “upper part to lower part” does not accurate in the context of sub-reports when not all CSI reports necessarily contain sub-reports, which should be a segment of the UCI sequence only for the corresponding sub-report(s)
* Summary of changes
  + Changes to note in Tables 6.3.1.1.2-13, 6.3.1.1.2-14, 6.3.2.1.2-6, and 6.3.2.1.2-7 to fix the above issues
* Consequences if not approved
  + Incorrect CSI mapping to UCI bit sequence for both CSI on PUCCH and PUSCH

------------------------------ Text Proposal (TP#1) for 38.212, Sections 6.3.1.1.2 and 6.3.2.1.2 --------------------------

\*\*\* Unchanged text omitted \*\*\*

If none of the CSI reports for transmission on a PUCCH is of two parts, the CSI fields of all CSI reports, in the order from upper part to lower part in Table 6.3.1.1.2-12, are mapped to the UCI bit sequence  starting with . The most significant bit of each field is mapped to the lowest order information bit for that field, e.g. the most significant bit of the first field is mapped to.

**Table 6.3.1.1.2-12: Mapping order of CSI reports to UCI bit sequence , without two-part CSI report(s)**

|  |  |
| --- | --- |
| **UCI bit sequence** | **CSI report number** |
|  | CSI report #1  as in Table 6.3.1.1.2-7/7A/8/8B |
| CSI report #2  as in Table 6.3.1.1.2-7/7A/8/8B |
| … |
| CSI report #n  as in Table 6.3.1.1.2-7/7A/8/8B |
| Note: For a CSI report #i containing *Ni*CSI sub-reports, where ~~i=1,2,…,n~~, all CSI sub-reports within the CSI report #i are mapped to the corresponding ~~part~~ segment of the UCI bit sequence of CSI report #i, from upper part to lower part of the segment, in increasing order of CSI sub-report number. CSI sub-report #1, CSI sub-report #2, …, CSI sub-report #~~n~~*Ni* correspond to the CSI sub-reports in increasing order of *CSI-ReportSubConfigID*. | |

If at least one of the CSI reports for transmission on a PUCCH is of two parts, two UCI bit sequences are generated,  and . The CSI fields of all CSI reports, in the order from upper part to lower part in Table 6.3.1.1.2-13, are mapped to the UCI bit sequence  starting with . The most significant bit of each field is mapped to the lowest order information bit for that field, e.g. the most significant bit of the first field is mapped to. The CSI fields of all CSI reports, in the order from upper part to lower part in Table 6.3.1.1.2-14, are mapped to the UCI bit sequence  starting with . The most significant bit of each field is mapped to the lowest order information bit for that field, e.g. the most significant bit of the first field is mapped to . If the length of UCI bit sequence  is less than 3 bits, zeros shall be appended to the UCI bit sequence until its length equals 3.

**Table 6.3.1.1.2-13: Mapping order of CSI reports to UCI bit sequence ,   
with two-part CSI report(s)**

|  |  |
| --- | --- |
| **UCI bit sequence** | **CSI report number** |
|  | CSI report #1 if CSI report #1 is not of two parts, or  CSI report #1, CSI part 1, if CSI report #1 is of two parts,  as in Table 6.3.1.1.2-7/7A/8/8B/9/9A/9B |
| CSI report #2 if CSI report #2 is not of two parts, or  CSI report #2, CSI part 1, if CSI report #2 is of two parts,  as in Table 6.3.1.1.2-7/7A/8/8B/9/9A/9B |
| … |
| CSI report #n if CSI report #n is not of two parts, or  CSI report #n, CSI part 1, if CSI report #n is of two parts,  as in Table 6.3.1.1.2-7/7A/8/8B/9/9A/9B |
| Note: For a CSI report #i containing *Ni* CSI sub-reports, where ~~i=1,2,…,n~~, either all CSI sub-reports not of two parts or CSI part 1 of all CSI sub-reports of two parts, ~~either a CSI sub-report without two-part, or CSI part 1 of a CSI sub-report with two-part CSI,~~ are mapped to the corresponding ~~part~~ segment of the UCI bit sequence of CSI report #i, from upper part to lower part of the segment, in increasing order of CSI sub-report number. CSI sub-report #1, CSI sub-report #2, …, CSI sub-report #~~n~~*Ni* correspond to the CSI sub-reports in increasing order of *CSI-ReportSubConfigID*. | |

where CSI report #1, CSI report #2, …, CSI report #n in Table 6.3.1.1.2-13 correspond to the CSI reports in increasing order of CSI report priority values according to Clause 5.2.5 of [6, TS38.214].

**Table 6.3.1.1.2-14: Mapping order of CSI reports to UCI bit sequence ,   
with two-part CSI report(s)**

|  |  |
| --- | --- |
| **UCI bit sequence** | **CSI report number** |
|  | CSI report #1, CSI part 2 wideband, as in Table 6.3.1.1.2-10/10A/10B if CSI part 2 exists for CSI report #1 |
| CSI report #2, CSI part 2 wideband, as in Table 6.3.1.1.2-10/10A/10B if CSI part 2 exists for CSI report #2 |
| … |
| CSI report #n, CSI part 2 wideband, as in Table 6.3.1.1.2-10/10A/10B if CSI part 2 exists for CSI report #n |
| CSI report #1, CSI part 2 subband, as in Table 6.3.1.1.2-11/11A/11B/[New Table] if CSI part 2 exists for CSI report #1 |
| CSI report #2, CSI part 2 subband, as in Table 6.3.1.1.2-11/11A/11B/[New Table] if CSI part 2 exists for CSI report #2 |
| … |
| CSI report #n, CSI part 2 subband, as in Table 6.3.1.1.2-11/11A/11B/[New Table] if CSI part 2 exists for CSI report #n |
| Note: For a CSI report #i containing *Ni* CSI sub-reports, where ~~i=1,2,…,n~~,   * ~~all the~~ CSI part 2 wideband~~s~~ of all CSI sub-reports are mapped to the corresponding ~~part~~ segment of the UCI bit sequence of CSI report #i, from upper part to lower part of the segment, in increasing order of CSI sub-report number; * CSI sub-report #1, CSI sub-report #2, …, CSI sub-report #~~n~~*Ni* correspond to the CSI sub-reports in increasing order of *CSI-ReportSubConfigID*. | |

where CSI report #1, CSI report #2, …, CSI report #n in Table 6.3.1.1.2-14 correspond to the CSI reports in increasing order of CSI report priority values according to Clause 5.2.5 of [6, TS38.214].

\*\*\* Unchanged text omitted \*\*\*

**Table 6.3.2.1.2-6: Mapping order of CSI reports to UCI bit sequence ,   
with two-part CSI report(s)**

|  |  |
| --- | --- |
| **UCI bit sequence** | **CSI report number** |
|  | CSI part 1 of CSI report #1 as in Table 6.3.2.1.2-3/3A/3B or Table 6.3.1.1.2-8/8A/8B |
| CSI part 1 of CSI report #2 as in Table 6.3.2.1.2-3/3A/3B or Table 6.3.1.1.2-8/8A/8B |
| … |
| CSI part 1 of CSI report #n as in Table 6.3.2.1.2-3/3A/3B or Table 6.3.1.1.2-8/8A/8B |
| Note: For a CSI report #i containing *Ni* CSI sub-reports, where ~~i=1,2,…,n~~, CSI part 1 of all CSI sub-reports are mapped to the corresponding ~~part~~ segment of the UCI bit sequence of CSI report #i, from upper part to lower part of the segment, in increasing order of CSI sub-report number. CSI sub-report #1, CSI sub-report #2, …, CSI sub-report #~~n~~ *Ni* correspond to the CSI sub-reports in increasing order of *CSI-ReportSubConfigID*. | |

where CSI report #1, CSI report #2, …, CSI report #n in Table 6.3.2.1.2-6 correspond to the CSI reports in increasing order of CSI report priority values according to Clause 5.2.5 of [6, TS38.214].

**Table 6.3.2.1.2-7: Mapping order of CSI reports to UCI bit sequence ,   
with two-part CSI report(s)**

|  |  |
| --- | --- |
| **UCI bit sequence** | **CSI report number** |
|  | CSI report #1, CSI part 2 wideband, as in Table 6.3.2.1.2-4/4A/4B,  or CSI part 2 with group 0, as in Table 6.3.2.1.2-5A/5B, if CSI part 2 exists for CSI report #1 |
| CSI report #2, CSI part 2 wideband, as in Table 6.3.2.1.2-4/4A/4B,  or CSI part 2 with group 0, as in Table 6.3.2.1.2-5A/5B, if CSI part 2 exists for CSI report #2 |
| … |
| CSI report #n, CSI part 2 wideband, as in Table 6.3.2.1.2-4/4A/4B,  or CSI part 2 with group 0, as in Table 6.3.2.1.2-5A/5B, if CSI part 2 exists for CSI report #n |
| CSI report #1, CSI part 2 subband, as in Table 6.3.2.1.2-5/5C/5D/[New Table],  or CSI part 2 with group 1 and 2, as in Table 6.3.2.1.2-5A/5B, if CSI part 2 exists for CSI report #1 |
| CSI report #2, CSI part 2 subband, as in Table 6.3.2.1.2-5/5C/5D/[New Table],  or CSI part 2 with group 1 and 2, as in Table 6.3.2.1.2-5A/5B,  if CSI part 2 exists for CSI report #2 |
| … |
| CSI report #n, CSI part 2 subband, as in Table 6.3.2.1.2-5/5C/5D/[New Table],  or CSI part 2 with group 1 and 2, as in Table 6.3.2.1.2-5A/5B,  if CSI part 2 exists for CSI report #n |
| Note: For a CSI report #i containing *Ni* CSI sub-reports, where ~~i=1,2,…,n~~,   * CSI part 2 wideband of all CSI sub-reports are mapped to the corresponding ~~part~~ segment of the UCI bit sequence of CSI report #i, from upper part to lower part of the segment, in increasing order of CSI sub-report number; * CSI sub-report #1, CSI sub-report #2, …, CSI sub-report # ~~n~~ *Ni* correspond to the CSI sub-reports in increasing order of *CSI-ReportSubConfigID*. | |

where CSI report #1, CSI report #2, …, CSI report #n in Table 6.3.2.1.2-7 correspond to the CSI reports in increasing order of CSI report priority values according to Clause 5.2.5 of [6, TS38.214].

\*\*\* Unchanged text omitted \*\*\*

---------------------------------------------------------- End Text Proposal --------------------------------------------------------

**(Rapporteur note: CPU/active resource/antenna ports counting)**

**Agreement@113**

For spatial domain adaptation or power domain adaptation, for CSIs reporting corresponding to N indicated sub-configurations from L sub-configurations in a CSI report, for the case without CSI payload reduction

* , where is the total number of CSI-RS resources corresponding to i-th sub-configuration in the CSI-RS resource set for channel measurement.
  + the summation is over N for A-CSI RS
  + This is for CSI processing criteria for NES in Clause 5.2.1.6 of TS 38.214

**Agreement@113**

Alt 2: For P-CSI reporting from L configured sub-configurations, support:

* All L configured sub-configurations are reported in every periodic occasion.
* The maximum value of L can be different for A-CSI, SP-CSI, and P-CSI.
* , where is the total number of CSI-RS resources corresponding to i-th sub-configuration in the CSI-RS resource set for channel measurement. (N=L in the equation)
* FFS: Details on active CSI-RS resource / port counting

**Agreement@114**

For SD and/or PD adaptation without UE complexity reduction, CPU counting of A/SP-CSI reporting is based on for CSIs reporting corresponding to N indicated sub-configurations from L configured sub-configurations in a CSI report.

**Agreement@114**

For a CSI report configuration containing sub-configuration(s), if a CSI-RS resource is referred by M sub-configurations among X sub-configurations, the CSI-RS resource is counted M times and CSI-RS ports within the CSI-RS resource are counted by

* Option 2A: for Type 1 SD adaptation, and for Type 2 SD or PD adaptation.
* is nrofPorts configured in NZP-CSI-RS-Resource and is the number of CSI-RS ports in sub-configuration s derived from port subset indication.
* It is understood that further discussions are necessary.

**Agreement@114bis**

* For a CSI report config containing sub-configuration(s), support in Table 5.4-2 of TS 38.214 for CSI computation delay requirements.



* For CPU occupation and update, if there are not enough CPUs for processing the entire CSI report, legacy UE behavior is used

Only Z2, Z2’ will be supported.

**Agreement@114bis**

* For CSI reporting in PUCCH, Table 6.3.1.1.2-7, Table 6.3.1.1.2-9 and Table 6.3.1.1.2-10 in TS38.212 are applicable for NES
* For CSI reporting on PUSCH, Table 6.3.2.1.2-3 and Table 6.3.2.1.2-4 in TS38.212 are applicable for NES
* Further discuss in this meeting about the applicability of below for NES
  + Table 6.3.1.1.2-8/8A/11 in TS38.212 (or a new table for replacement of Table 6.3.1.1.2-11)
  + Table 6.3.2.1.2-5 in TS38.212 (or a new table for replacement)

**Power domain (PD) adaptation and joint operation**

**Agreement@112**

For adaptation of power offset values between PDSCH and CSI-RS, further study the following

* Where/how to configure multiple power offset values
  + Whether/how one or more power offset values are dynamically indicated to UE for CSI measurement/reporting, and PDSCH reception
  + Overhead reduction for CSI reports associated with multiple power offset values between PDSCH and CSI-RS
  + Whether other UE report content can be included

**Agreement@112bis-e**

For power domain adaptation, for CSI(s) reporting, support configuration of more than one power offset values for PDSCH relative to CSI-RS

* FFS: impact on CSI processing requirement
* FFS: details on configuration/indication of the power offset values
* FFS: whether/how to additionally consider the case where CSI-RS power is changed

**Agreement@112bis-e**

For power domain adaptation, support the following configuration(s) for CSI-RS resource configuration,

* A1-2-power: one or more resources can be configured in a resource set within a resource setting and each resource can be associated with one or more power offset values
* FFS: A1-1-power: a resource set with multiple resources is configured within a resource setting, where resources can have different power offset values
* FFS: Details of how the different power offset values(s) are configured/indicated.

**Agreement@113**

Joint operation of SD and PD adaptation is supported.

**Agreement@114**

For power domain adaptation only, all CSI-RS resource(s) (which can be one or more) in the CSI-RS resource set for channel measurement are associated with each sub-configuration provided in a CSI report configuration

* Each sub-configuration contains an offset value (e.g. X) that is commonly applied to all the resources within the resource set. For a CSI-RS resource in CSI resource configuration, the *PDSCH to CSI-RS EPRE offset* (e.g. Y) for CSI calculation is determined based on *powerControlOffset* (e.g. Z) value in CSI resource configuration and the offset value configured in CSI sub-configuration in the report configuration.
  + Only legacy values are applicable for the resulted power control offset values
  + It is expected that the sub-configuration leads to a value no larger than power control offset value provided in CSI resource configuration

**Agreement@114**

For joint operation of SD and PD, each subConfig contains corresponding parameters for an SD adaptation and/or parameters for a PD adaptation.

**Agreement@114bis**

Remove the square brackets as below for TS 38.214

|  |
| --- |
| **5.2.2.5 CSI reference resource definition**  <omitted text>  - if a sub-configuration indicates a power offset *[powerOffset]*,for CQI calculation, the UE shall assume the corresponding PDSCH signals transmitted on the antenna ports of a CSI-RS resource would have a ratio of EPRE to CSI-RS EPRE equal to the ~~[~~difference~~]~~ between *powerControlOffset* of the CSI-RS resource, given in Clause 5.2.2.3.1, and *[powerOffset]* ~~[~~, where the differenceis expected to take one of the values that can be configured for *powerControlOffset* of the CSI-RS resource, given in Clause 5.2.2.3.1, and is also expected to take a value that is no larger than the value of *powerControlOffset*~~]~~*.*  <omitted text> |

* The range of [powerOffset] in the above TP is [0…23] in dB with step size of 1 dB.

**Agreement@114bis**

Adopt the following TP for TS 38.214, Clause 5.2.1.1

=== start of TP===

The time domain behavior of the *CSI-ReportConfig* is indicated by the higher layer parameter *reportConfigType* and can be set to 'aperiodic', 'semiPersistentOnPUCCH', 'semiPersistentOnPUSCH', or 'periodic'. For 'periodic' and 'semiPersistentOnPUCCH'/'semiPersistentOnPUSCH' CSI reporting, the configured periodicity and slot offset applies in the numerology of the UL BWP in which the CSI report is configured to be transmitted on. The higher layer parameter *reportQuantity* indicates the CSI-related, L1-RSRP-related, L1-SINR-related, CapabilityIndex-related or TDCP-related quantities to report. The *reportFreqConfiguration* indicates the reporting granularity in the frequency domain, including the CSI reporting band and if PMI/CQI reporting is wideband or sub-band. The *timeRestrictionForChannelMeasurements* parameter in *CSI-ReportConfig* can be configured to enable time domain restriction for channel measurements and *timeRestrictionForInterferenceMeasurements* can be configured to enable time domain restriction for interference measurements. The *CSI-ReportConfig* can also contain *CodebookConfig*, which contains configuration parameters for Type-I, Type II, Enhanced Type II CSI, Further Enhanced Type II Port Selection, Enhanced Type II for coherent joint transmission (CJT), Further Enhanced Type II Port Selection for CJT, Enhanced Type II for predicted PMI, or Further Enhanced Type II Port Selection for predicted PMI including codebook subset restriction when applicable, and configurations of group-based reporting. A UE is not expected to be configured with a CSI report setting associated with a dormant DL BWP if the *reportConfigType* is set to 'aperiodic'. A *CSI-ReportConfig* can contain a list of sub-configurations, provided by the higher layer parameter [*csi-ReportSubConfigList],* where each sub-configuration is identified by [*csi-ReportSubConfigID*] and corresponds to a list of one or more CSI-RS resources or corresponds to a CSI-RS antenna port subset, and/or corresponds to a power offset for PDSCH relative to CSI-RS additional to *powerControlOffset* of the CSI-RS resource. A UE is not expected to be configured with a *CSI-ReportConfig* that contains a mix of sub-configuration(s) each corresponding to a list of one or more CSI-RS resources and some other sub-configuration(s) each corresponding to CSI-RS antenna port subset.

=== end of TP===

|  |  |
| --- | --- |
| Reason for changes | Clarify that the power offset is an additional RRC parameter, i.e. not the parameter PowerControlOffset thus not the power of PDSCH relative to CSI-RS. |
| Summary of changes | Adding clarification. |
| Consequences if not approved | There can be misunderstanding that the powerOffset is used as replacement of PowerControlOffset |
| Note: this table is added by Rapporteur | |

**L1 signaling aspects**

**Agreement@112**

Discuss the signalling aspects for spatial/power domain adaptation for Rel-18 NES-capable UEs considering that

* Whether there is a need for transition time per adaptation (for UE)
* Whether/How to inform UE on spatial adaptation pattern update and/or PDSCH/CSI-RS transmission power change due to adaptation.

**Agreement@112bis-e**

For Semi-persistent/Aperiodic CSI reporting with , study what enhancements to the current DCI and MAC-CE mechanisms are needed for gNB triggering/indication/activation of the N CSI(s) in a reporting instance, where the N CSI(s) are associated with N sub-configuration(s) from L in a report config.

**Agreement@113**

For N>=1 CSI reporting corresponding to N out of L sub-configurations in one reportConfig where each sub-configuration corresponding to an SD adaptation pattern or/[and] a powerControlOffset value,

* For A-CSI and SP-CSI on PUSCH report, support DCI-based triggering
  + For A-CSI-RS, CPU and CSI-RS resource/port counting depend on N indicated sub-configurations
    - FFS: How to do the counting
  + FFS: For P-CSI-RS/SP-CSI-RS, CPU and CSI-RS resource/port counting depend on L or N sub-configurations
* For SP-CSI on PUCCH report, support MAC-CE-based triggering
  + FFS: For P-CSI-RS/SP-CSI-RS, CPU and CSI-RS resource/port counting depend on L or N sub-configurations

Note: UE complexity reduction is not precluded

* For DCI-based triggering,
  + Alt 1: A triggering state corresponding to N sub-configurations is indicated via the existing CSI request field in DCI. Different triggering states could represent different subsets of L sub-configurations.
    - The DCI is UE specific (in this case, legacy DCI format applies)
* For MAC-CE based triggering
  + Opt 2: An indication to select to N sub-configurations in a MAC-CE is supported
    - It is up to RAN2 to decide the signaling designs of the MAC-CE (including whether it is a new MAC CE or an existing MAC CE)
    - Only one MAC CE is used for this triggering

**Agreement@114**

For sub-configuration triggering of A-CSI, an indication for N sub-configurations out of L sub-configurations for a triggering state is configured in *CSI-AssociatedReportConfigInfo*.

* No change to current CSI request field in DCI.

**Agreement@114**

For sub-configuration triggering of SP-CSI on PUSCH report, an indication for N sub-configurations out of L sub-configurations for a triggering state is configured in *CSI-SemiPersistentOnPUSCH-TriggerState*.

* No change to current CSI request field in DCI.

**Conclusion@114**

There is no consensus to support the following:

Option 1: support indication of spatial and/or transmission power adaptation in one of the following approaches (same approach for SD and PD adaptation) in addition to the agreed triggering/activation signalling

* Alt 1: MAC-CE/RRC for indication of corresponding subConfig ID that gNB has applied as adaptation
  + Note: need to take this RAN2 LS in [R1-2306380](file:///C:\Users\younsun\Documents\3GPP%20documents\RAN1%20tdocs\TSGR1_114\Docs\R1-2306380.zip) into account
* Alt 2: UE specific DCI
  + A new field in existing non-fallback UE specific DCI formats is introduced
    - If agreed, the number of bits are to be discussed at CR stage.

**BM/TCI states related aspects**

**Agreement@113**

* Downselect one of the following for BM enhancements in RAN1#114
  + - Case 1: Support scaling the threshold of beam failure detection and threshold of candidate beam identification for power domain network energy saving
    - Case 2: Support UE to send hypothetical beam failure and/or radio link failure (RLF) reports for the indicated hypothetical power offset values.
    - Case 3: No further work on BM enhancements
* Downselect one of the following for TCI configuration enhancement in RAN1#114
  + - Method 1: Configure multiple candidate CSI-RS resources as reference signal for QCL information or for spatial relation information, and switch one of them based on L1/L2 signaling
    - Method 2: Configure multiple candidate sets of TCI state(s) associated with DL/UL signal/channel and switch one of them based on L1/L2 signaling
    - Method 3: No further work on TCI configuration enhancement

**Conclusion@114**

* No further work on BM enhancements for R18 NES.
* No further work on TCI configuration enhancement for R18 NES.

**Other logistics for SD/PD adaptation**

**Agreement@112**

For spatial and power domain adaptation, solution(s) based on adaptation within an active BWP is considered as baseline

## C. Objectives

|  |
| --- |
| The objectives of the work item are the following:   1. Specify SSB-less SCell operation for inter-band CA for FR1 and co-located cells, if found feasible by RAN4 study, where a UE measures SSB transmitted on PCell or another SCell for an SCell’s time/frequency synchronization (including downlink AGC), and L1/L3 measurements, including potential enhancement on SCell activation procedures if necessary [RAN4, RAN2] 2. Specify enhancement on cell DTX/DRX mechanism including the alignment of cell DTX/DRX and UE DRX in RRC\_CONNECTED mode, and inter-node information exchange on cell DTX/DRX [RAN2, RAN1, RAN3]  * Note: No change for SSB transmission due to cell DTX/DRX. * Note: The impact to IDLE/INACTIVE UEs due to the above enhancement should be avoided.  1. Specify the following techniques in spatial and power domains  * Specify necessary enhancements on CSI and beam management related procedures including measurement and report, and signaling to enable efficient adaptation of spatial elements (e.g. antenna ports, active transceiver chains) [RAN1, RAN2] * Specify necessary enhancements on CSI related procedures including measurement and report, and signaling to enable efficient adaptation of power offset values between PDSCH and CSI-RS [RAN1, RAN2] * Note: Above objectives are only for UE specific channels/signals * Note: Legacy UE CSI/CSI-RS capabilities applies when considering total number of CSI reports and requirements  1. Specify mechanism(s) to prevent legacy UEs camping on cells adopting the Rel-18 NES techniques, if necessary [RAN2] 2. Specify CHO procedure enhancement(s) in case source/target cell is in NES mode [RAN2] 3. Specify inter-node beam activation and enhancements on restricting paging in a limited area [RAN3]. 4. Specify the corresponding RRM/RF core requirements, if necessary, for the above features [RAN4] |