**3GPP TSG RAN WG1#122 R1-2506253**

**Bengaluru, India, Aug 25th – 29th, 2025**

**Agenda item:** 9.2.1

**Source:** Moderator (ZTE)

**Title:** Moderator Summary #1 on UE-initiated/event-driven beam management

**Document for:** Discussion and Decision

1. Introduction

In RAN#102, the Rel-19 WID on NR MIMO phase 5 is approved. In the approved WID, UE-initiated/event-driven beam management is a part of the RAN1 objectives as follows:

|  |
| --- |
| 1. Specify enhancement to facilitate UE-initiated/event-driven beam management for reducing overhead and/or latency, assuming the unified TCI while leveraging (as much as possible) legacy CSI measurement and reporting configuration frameworks, targeting FR2 and sTRP with intra- and inter-cell beam management    1. UL signaling content(s) (and procedure(s) as required) for UE-initiated/event-driven beam reporting facilitating fast beam switching    2. UL signaling medium/container considering the UE-initiated/event-driven nature of the UL transmission, designed primarily for the purpose of beam reporting |

1. Plan

Per Mr. Chair’s guidance, for Rel-19 maintenance, only essential corrections will be considered: only text proposals are to be submitted (i.e., no individual draft CRs).

* For each text proposal, we need to provide relevant information (e.g. reason for change, summary of change, consequences if not approved) in a clear and concise manner
* Finally, Editors to prepare final CRs

Then, based on the outcome of the contributions from companies [1]-[36], the followings are provided in this document:

* Summary of companies’ views on each of open issues raised by interested companies, where the open issues/TPs are categorized as follow:
  + Issue 1 – Trigger-event detection
  + Issue 2 – UL signaling content(s)
  + Issue 3 – UL signaling medium/container
  + Issue 4 – Cross-CC measurement/report
* Observations and recommended proposals based on the summary of companies’ views

Note-1: As mentioned in [21], we may have an in-coming LS from RAN4 (R4-2508391) on measurement restriction for UEIBR (which was approved in RAN4 but not delivered to RAN1, unfortunately, before RAN1#122 tdoc deadline). Once having that soon, we may have another session on handling this LS.

Note-2: While considering the progress of each of above issues, we optionally directly provide the proposals, in order to identify clear guidance/consensus for subsequent TP/CR drafting. Then, some editorial TPs, i.e., correcting typos or capturing agreement(s), are recommended to be provided to Editors, directly.

1. Contact Person

For potential offline discussion, companies/delegates are encouraged to enter the contact information in the table below:

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|  |  |  |
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1. Discussion

## Issue 1 – Trigger-event detection

Table 1-1 Summary for Issue 1

|  |  |  |
| --- | --- | --- |
| **#** | **Issue** | **Companies’ view and Recommended Proposal** |
| 1.1 | Left-over for current beam for Event-2  ——  Extra condition(s) of resetting the counting | **[120] Agreement**  Regarding triggering event determination for Event 2, at least Candidate #2 is supported for resetting the counting.   * Candidate#1: RS reconfiguration/update or MAC-CE signaling (if supported) for new beam is received;   + FFS: whether to reset the counting for all new beams.   + FFS: whether to maintain the counting whose new beam is NOT updated. * Candidate#2: [The measured current beam based on] indicated TCI state is updated;   + In such case, the UE need to reset the counting for all new beams. * Candidate#3: UEI beam report is transmitted;   + FFS: Only reset the counting of new beams fulfilling triggering condition and reported by the UEI beam report * Candidate#4: NW response (e.g., DCI in step-2 of Mode-A) is detected. * Candidate#5: The time window expires * Candidate#6: The threshold for event evaluation is re-configured by RRC signaling * (FFS) Candidate#7: The RRC parameter(s) associated with the CSI report configuration for UEI beam report is reconfigured.   + FFS: RRC parameter(s) * FFS: Other candidates   Note: Whether this proposal is captured in RAN1 or RAN2 is a separate discussion point.  **[120b] Agreement**  Regarding triggering event determination for Event 2, on resetting the counting, the following modification on the agreed Candidate #2 in RAN1#120 is supported.   * Candidate#2: ~~[~~The measured current beam RS is updated based on~~]~~ indicated TCI state ~~is updated~~;   + In such case, the UE needs to reset the counting for all new beams.   + FFS: Further details on the update (if necessary)   FL Note: Then, per companies input, a list of companies [1, 2], [4], [7], [10], [15], [18, 26] prefer to finish this discussion. Per majority support, let’ try the following wording.   * BTW, several companies mentioned that the corresponding timer should be stopped as well. That’s reasonable.   **Proposal 1.1:** Regarding triggering event determination, besides for Candidate#2, at least Candidate #1, Candidate#3, Candidate#5 and Candidate#7 are additionally supported for resetting the counting and stopping the timer.   * Candidate#1: RS reconfiguration for new beam is received;   + In such case, the UE only needs to reset the counting of [the newly-reconfigured new beams/all new beams], and stops the timers for those new beams. * Candidate#3: UEI beam report is transmitted.   + In such case, the UE only resets the counting of [new beams fulfilling triggering condition and reported by the UEI beam report/all new beams], and stops the timers for those new beams. * Candidate#5: The timer expires.   + In such case, the UE only needs to reset the counting for the new beam~~s~~ corresponding to the timer. * Candidate#7: The RRC parameter(s) of the threshold for event evaluation in Event-1/2 value of Q in Event-7, *eventInstanceCount* and *eventDetectionTimeWindowLength* are reconfigured for the CSI report configuration for UEI beam report.   + ~~The RRC parameter(s) at least comprises the threshold for event evaluation in Event-1/2 value of Q in Event-7,~~ *~~eventInstanceCount~~* ~~and~~ *~~eventDetectionTimeWindowLength~~*~~;~~   + In such case, the UE need to reset the counting and stop the timers for all new beams.   When Candidate#2 is satisfied, the timers for all new beams should be stopped, besides for resetting counting.  Note: Candidate#2: The measured current beam RS is updated based on indicated TCI state  Supported by: Apple, Ericsson, Huawei/HiSi, ZTE, NTT DOCOMO, Spreadtrum (at least #1), UNISOC, xiaomi, ofinno, Fujitsu, google, vivo, Lenovo, Samsung(?), CATT(#1,5,7), NEC, ETRI,  Not support Candidate#1: OPPO,  Not support Candidate#3: Qualcomm, Panasonic, NTT DOCOMO,  Not support Candidate#5: OPPO, Qualcomm,  Not support Candidate#7: |
| 1.2 | Editorial issues on event detection | FL Note: Then, per companies input [6, 9], the following editorial update is provided, especially for clarifying that, regarding Event-7, the valueOfQ-th highest L1-RSRP is selected from the SS/PBCH blocks QCLed with the activated TCI state reference signals according to the agreement.  **Proposal 1.2:** Adopt the following changes in TS38.213 Section 5.2.1.5.4.1:   * **Reason for change:** Besides for correcting typos, when “current” beam RS for event evaluation is SSB QCLed with RS in an activated TCI state, two interpretations of the current beam RS having “the Q-th best quality” are possible:   + Interpretation-1: the SSB having the Q-th best quality among all SSBs QCLed with the RSs in all the activated TCI states   + Interpretation-2: the SSB QCLed with the RS having the Q-th best quality among all RSs in all the activated TCI states   ~~The above Interpretation-2 is more aligned with the definition of Event-7, i.e., the activated TCI state with the Q-th best quality, and also the agreed candidate values of Q (up to 8).~~   * **Summary of change:**    + In TS38.214 section 5.2.1.5.4.1, add “state” after “indicated TCI”.   + In TS38.214 section 5.2.1.5.4.1b, revise “L1-RSRPs” to “L1-RSRP”.   + In TS38.214 section 5.2.1.5.4.1c, clarify the current beam RS determination when *enabledCurrentBeamReport* is configured for event-7, i.e., capturing the interpretation-1. * **Consequences if not approved:** It can cause inconsistency in the specification description.  |  | | --- | | 5.2.1.5.4.1 UE Initiated CSI reporting  For a UE configured with a *CSI-ReportConfig* with *eventType* for periodic reference signals with the same periodicity configured by the *newBeamResourceSet*, without *eventDetectionTimeWindowLength,* and with *dl-OrJointTCI-StateList*, when an event instance is determined (as described in the following clauses),  - for a reference signal configured by the *newBeamResourceSet*, if *eventType* is set to ‘event2’ or ‘event7’, or  - for the reference signal in the indicated TCI state or the SS/PBCH block which is QCLed with the reference signal in the indicated TCI state, if *eventType* is set to ‘event1’,  the UE transmits UEIRI on a PUCCH format 0 or format 1 in the PUCCH resource (in the CC provided by *pucchCell,* if configured, in the *CSI-ReportConfig*) configured by *PUCCHResource* in the *CSI-ReportConfig*.  For a UE configured with a *CSI-ReportConfig* with *eventType* for periodic reference signals with the same periodicity configured by the *newBeamResourceSet*, with *eventDetectionTimeWindowLength*, and with *dl-OrJointTCI-StateList,* when an event instance is determined (as described in the following clauses),  - for a reference signal configured by the *newBeamResourceSet*, if *eventType* is set to ‘event2’ or ‘event7’, or  - for the reference signal in the indicated TCI state or the SS/PBCH block which is QCLed with the reference signal in the indicated TCI state, if *eventType* is set to ‘event1’,  the UE  - starts a timer for such reference signal from the initial value equal to the time window length provided by *eventDetectionTimeWindowLength* and sets the counter to 1,if the timer for such reference signal is not running; or  - increments the counter for such reference signal by 1, if the timer for such reference signal is running.  < Unchanged parts are omitted >  5.2.1.5.4.1c UE Initiated CSI reporting for event 7  < Unchanged parts are omitted >  After transmitting UEIRI, the UE reports, as defined in Clause 6.3.2.1.2 of [5, TS 38.212] in a single reporting instance *nrofReportedRS-UEIBR* CRIs or SSBRIs corresponding to reference signals provided by the *newBeamResourceSet* that comprise at least one reference signal that triggers the UEIRI transmission. For each CRI or SSBRI, the CSI report includes the absolute L1-RSRP or differential L1-RSRP and, when *PresenceOfConditionMetIndicator* is configured a condition met indicator indicating whether the reference signal indicated by reported CRI or SSBRI triggers the UEIRI transmission and, when *enabledCurrentBeamReport* is configured, the differential L1-RSRP corresponding to the reference signal with the *valueOfQ*-th highest L1-RSRP out of the activated TCI state reference signals, or to the SS/PBCH block with the *valueOfQ*-th highest L1-RSRP out of the SS/PBCH blocks QCLed with the activated TCI state reference signals ~~which is QCLed with the reference signal with the~~ *~~valueOfQ~~* ~~highest L1-RSRP out of the activated TCI state reference signals~~. The UE sends the CSI report  - on a PUSCH indicated by the DCI format 0\_1/0\_2 in a PDCCH reception if *reportTransmissionMode* is configured as ‘ModeA’ and the CSI trigger state associated with the *CSI-ReportConfig* is indicated in the CSI request field in the DCI format 0\_1/0\_2, or  - on a type 1 CG-PUSCH configured by *configuredPUSCHResourceOfModeB* in the same CC as the corresponding *CSI-ReportConfig*, on the first available transmission occasion *numOfSymbols-ModeB* symbols after the end of the transmitted PUCCH if *reportTransmissionMode* is configured as ‘ModeB’, where the periodicity of the PUCCH resource and type 1 CG-PUSCH resource is the same, *numOfSymbols-ModeB* is based on the numerology of the PUCCH resource with UEIRI transmitted, and the CG-PUSCH does not carry UL-SCH.  < Unchanged parts are omitted > |   **Supported by:** vivo, Samsung, OPPO, xiaomi, Lenovo, Ofinno, Fujitsu, ZTE, MediaTek, Google, NEC, Ericsson, Apple, NTT DOCOMO, ETRI,  **Not supported by:** Huawei, |
| 1.3 | Interpreting a status of UEI report triggering | FL Note: Per companies input [2], [4], [11], while considering multiple triggered new beams or events/CCs, the transmission condition of UEIRI and/or the corresponding UEI beam report is unclear. Even though the counter is greater than or equal to *eventInstanceCount*, if the current beam as in the indicated TCI state is updated before first PUCCH and/or second PUSCH, whether the transmission of UEIRI and/or the corresponding UEI beam report is questionable. Then, whether we need to consider some more condition of canceling the pending UE-initiated CSI report is questionable.  **Proposal 1.3:**  Adopt the following changes in Clause 5.2.1.5.4.1 in TS38.214.   |  | | --- | | 5.2.1.5.4.1 UE Initiated CSI reporting For a UE configured with a *CSI-ReportConfig* with *eventType* for periodic reference signals with the same periodicity configured by the *newBeamResourceSet*, without *eventDetectionTimeWindowLength,* and with *dl-OrJointTCI-StateList*, when an event instance is determined (as described in the following clauses),  - for a reference signal configured by the *newBeamResourceSet*, if *eventType* is set to ‘event2’ or ‘event7’, or  - for the reference signal in the indicated TCI state or the SS/PBCH block which is QCLed with the reference signal in the indicated TCI, if *eventType* is set to ‘event1’,  a UE-initiated CSI report triggered for the reference signal is considered to be pending.  If at least one UE-initiated CSI report triggered for the reference signal is pending, the UE transmits UEIRI on a PUCCH format 0 or format 1 in the PUCCH resource (in the CC provided by *pucchCell,* if configured, in the *CSI-ReportConfig*) configured by *PUCCHResource* in the *CSI-ReportConfig*.  <Irrelevant part is omitted>  If the number of event instances determined by the counter for such reference signal is greater than or equal to *eventInstanceCount*, a UE-initiated CSI report triggered for such reference signal is considered to be pending. If at least one UE-initiated CSI report triggered for the reference signal is pending, ~~and~~ the UE transmits UEIRI on a PUCCH format 0 or format 1 in the PUCCH resource (in the CC provided by *pucchCell,* if configured, in the *CSI-ReportConfig*) configured by *PUCCHResource* in the *CSI-ReportConfig*.  The UE cancels the pending UE-initiated CSI report triggered for such reference signal:  - if a CSI report including the reference signal in a reporting instance as defined in Clause 5.2.1.5.4.1a, 5.2.1.5.4.1b or 5.2.1.5.4.1c.  <Irrelevant part is omitted> |   Supported by: Ofinno, ZTE, xiaomi, Fujitsu, Qualcomm, Spreadtrum, NEC, Ericsson, NTT DOCOMO, ETRI,  Not supported by: OPPO, vivo, Lenovo, Samsung, Google, CATT, Panasonic, Huawei, Apple,  **Proposal 2.3B:**  Adopt the following changes in Clause 6.3.2.1.2 in TS38.214.   |  | | --- | | **6.3.2.1.2 CSI**  <Irrelevant part is omitted>  Table 6.3.2.1.2-3I: Mapping order of CSI fields of one report for CSI report configuration indicator/CRI/RSRP/Condition met indicator, or CSI report configuration indicator/SSBRI/RSRP/Condition met indicator  <Irrelevant part is omitted>  NOTE:  The CSI report configuration indicator with value indicates the (*+1)*-th CSI report configuration among the CSI report configurations associated with a same PUCCH resource configured by *firstPUCCHResourceConfig-UEIBR*, which are ordered in ascending order of *CSI-ReportConfigID*.  The condition met indicators are reported only when the UE is configured with higher layer parameter *PresenceOfConditionMetIndicator*. If UEI report triggering is pending for the reference signal associated with CRI or SSBRI #*j* that satisfies the condition for transmitting UEIRI as defined in Clause 5.2.1.5.4.1 in [6, TS 38.214] when *eventDetectionTimeWindowLength* is configured, the value of the condition met indicator #*j* is set to 1; otherwise set to 0.  <Irrelevant part is omitted> |   Supported by: ZTE, xiaomi, Ofinno, Fujitsu, Google, Qualcomm, Spreadtrum, Ericsson, NTT DOCOMO, ETRI,  Not supported by: OPPO, vivo, Lenovo, Samsung, CATT, Panasonic, Huawei, |
| 1.5 | RRC candidate values on event-detection | FL Note: Per companies input [9, 26], we need to handle the following pending candidate values for RRC parameter on event detection.  **Proposal 1.4 (R1-2505533):**  Update the RRC candidate values for a threshold value eventThreshold-Event1-r19 for trigger event detection regarding Event-1.   * only values **16**, …,113 in RSRP-Range are valid.   Supported by: Samsung, vivo, Ofinno, ZTE, MediaTek, Google, Spreadtrum, CATT, NEC, Ericsson, Apple, NTT DOCOMO, ETRI,  Not supported by: OPPO, Lenovo, Huawei, |

Table 1-2 Company input for Issue 1

|  |  |
| --- | --- |
| **Company** | **Input** |
| Mod V00 | * Please input your comment/preference to those proposals and questions on the issue 1.1~1.5, if needed. |
| OPPO | Re 1.1: (1) we do not support Candidate#1, the newly configured beam did not have any counter yet, why do we need to specify the reset rule (2) Do not support #5: it contradicted with our previous agreement. (3) #7: We need to specify which RRC parameter(s) are reconfigured, instead of a too general description in the main bullet of #7. We support the reconfiguration of threshold and the value of Q.  [Mod]: For Candidate#7, your suggestion has been captured.  1.2: Ok  1.3 and 1.3B: do not support. The proposals introduced a new concept which was never discussed before. The definition of triggering condition is clear and specification is complete. We should not introduce any new non-essential design in maintance stage.  1.4: Not essential issue. Restriction the values is not needed. The gNB with reasonable design would configure a proper value.  [Mod]: Captured! |
| vivo | **Proposal 1.1:** Fine. For Candidate#1, we think it should be supported. According to the agreements achieved before, when new beam RSs change as follows: t0:(RS#1, RS#2, RS#3), t1: (RS#2, RS#3, RS#4), t2: (RS#1, RS#4, RS#5). The timer for RS#1 is not stopped and the corresponding counter is not reset at t1. Thus, when RS#1 is reconfigured as new beam RS at t2, if operations in Candidate#1 are not allowed, UE will perform event evaluation for RS#1 based on the old timer and counter in t1. It is not reasonable. To avoid this issue, Candidate#1 should be supported.  **Proposal 1.2**: If the interpretation-2 is more aligned with the definition of the Event-7, the third change in the text proposal is not needed.  [Mod]: Sorry for misleading. The intention is to go with #1.  **Proposal 1.3**: The current specification is clear and the additional description of UEIBR triggering status is not needed.  **Proposal 1.4:** Fine with the correction on the valid range of L1-RSRP. |
| Lenovo | **Proposal 1.1:** We are fine with the proposal in general. However, for Candidate#5, there is no timer expire.It should be updated to match previous agreement.  [Mod]: The intention of Candidate#5 is to further clarify the UE behavior upon timer expire.  **Proposal 1.2:** Support.  **Proposal 1.3 and 1.3B:** Do not support. Same view with OPPO that it was never discussed before. The beam report still provides useful information to the gNB even the current beam is updated.  **Proposal 1.4:** Not essential. |
| Samsung | **Proposal 1.1**: do not support. Event for Candidate #7, there is no need to discuss/specify impact of RRC reconfigurations on UEIR. For legacy P/SP/AP CSI reporting, we do not have such special handling of RRC reconfigurations, not sure what is different now for UEI beam reporting. In terms of RRC configurations, we only need to specify which parameter(s) such as threshold, time window length and etc. that defines event evaluations.  [Mod]: Time window length is captured. Is that okay for you?  **Proposal 1.2**: support.  **Proposal 1.3/1.3B**: do not support; we do not think there is a need to define condition(s) of whether (or not) to pend/cancel UEI beam report or specify the corresponding UE’s behaviors – it can be up to the UE.  **Proposal 1.4**: support. |
| Xiaomi | Proposal 1.1: support  Proposal 1.2: we suggest to use the description in interpretation-2, which is much clearer.  Proposal 1.3/2.3B: fine with the principle. But the issue of “if the current beam as in the indicated TCI state is updated before first PUCCH and/or second PUSCH, whether the transmission of UEIRI and/or the corresponding UEI beam report” is not solved. We suggest the revised one below:  The UE cancels the pending UE-initiated CSI report triggered for such reference signal:  - if a CSI report including the reference signal in a reporting instance as defined in Clause 5.2.1.5.4.1a, 5.2.1.5.4.1b or 5.2.1.5.4.1c.  - if the reference signal in the new indicated TCI state is same as such reference signal.  [Mod]: Let’s try to make current proposal stable firstly. Then, additionally new feature may not be helpful. |
| Ofinno | **Proposal 1.1:**  Support the proposal. For candidate #7, in addition to the threshold value, there are other RRC parameter(s) such as time window and maximum event instance count associated with the CSI report configuration for UEI beam report to be supported:  [Mod]: Captured!  **Proposal 1.2:**  Support the proposal to be aligned with the agreement we have.  **Proposal 1.3:**  We support the FL’s view, as the transmission condition of UEIRI and the corresponding UEI beam report is unclear when the TCI state is updated before the first PUCCH/second PUSCH, and the ambiguity becomes even worse when multiple beams, events, or CCs are involved. Therefore, it is important to clearly define the cancellation of UEIBR. For example, when the TCI state is updated before the first PUCCH/second PUSCH, or when an SCell with new candidate beams is deactivated and later reactivated, it is not clear whether the UE should still transmit UEIBR. Likewise, in the case where a UE detects beam failure, it likely that multiple CSI report configurations for UEIBR are triggered, and once the network updates the TCI state after receiving the first PUCCH for one CSI report configuration, it remains uncertain whether the UE should continue transmitting UEIBR for the other CSI report configurations, which is unccessary. These situations demonstrate why introducing the pending concept is necessary.  **Proposal 2.3B:**  Support.  **Proposal 1.4:**  Support to amend it. |
| Fujitsu | **Proposal 1.1**: The wording “stop the timer” may not be accurate. When the counting is reset, the intention is that the timer can start from the initial value for the next time when an event instance is determined. If the timer is just stopped, the timer will start from the value where it is stopped, which is not aligned with the intention. Therefore, it is proposed that “stop the timer” is changed to “the timer is considered as expired” to reflect the intention correctly.  [Mod]: Guess not. The same principle used for RAN2-MAC is considered herein. Once the timer is running, the timer is set to *eventDetectionTimeWindowLength*  **Proposal 1.2**: Support the text change. The changed text is according to Interpretation-1 in the “reason for change”. However, in the “reason for change”, it is saying “Interpretation-2 is more aligned with the definition of Event-7”. The “reason for change” part should be modified to align with the text change.  [Mod]: Good captured. Done!  **Proposal 1.3**: Fine with the proposal. If a report has been transmitted, the report should not be transmitted again. Equivalently, it can be seen as the report is cancelled. In that sense, we support to define a pending concept and to cancel a pending report if transmitted. |
| ZTE | **Proposal 1.1: Support**  We think Candidate#1 can be combined into Candidate#7 due to it was adopted that *newBeamResourceSet-r19* is configured in *CSI-ReportConfig*, thereby we suggest the following update of Candidate#7.   * Candidate#7: The RRC parameter(s) associated with the CSI report configuration for UEI beam report is reconfigured.   + The RRC parameter(s) at least comprises the threshold for event evaluation in Event-1/2 and value of Q in Event-7;     - In such case, the UE need to reset the counting and stop the timers for all new beams.   + The RRC parameter(s) at least comprises the RS reconfiguration for new beam;     - In such case, the UE only needs to reset the counting for the newly-reconfigured new beams, and stops the timers for those new beams.   [Mod]: Good suggestion. If other companies echo that, we may consider to reformulate the Candidate#1&7.  **Proposal 1.2: Support the TP**  Notably, this TP is to capture Interpretation-1 (which is also our understanding of current beam for Event-7) but the description part of **Reason for change**, i.e., “The above Interpretation-2 is more aligned with the definition of Event-7, i.e., the activated TCI state with the Q-th best quality, and also the agreed candidate values of Q (up to 8).” is somehow controversial with this TP, it needs to be clarified.  [Mod]: Good captured. Done!  **Proposal 1.3: Support the two TPs**  Based on the current spec as follows, it incurs one ambiguous case when the current beam as in the indicated TCI state is updated before first PUCCH and/or second PUSCH transmitted, whether UEIRI and/or the corresponding UEI beam report can be transmitted even though the counter is greater than or equal to *eventInstanceCount*?  5.2.1.5.4.1 UE Initiated CSI reporting  ...  If the number of event instances determined by the counter for such reference signal is greater than or equal to *eventInstanceCount*, the UE transmits UEIRI on a PUCCH format 0 or format 1 in the PUCCH resource (in the CC provided by *pucchCell,* if configured, in the *CSI-ReportConfig*) configured by *PUCCHResource* in the *CSI-ReportConfig*.  The counter of the event instances for such reference signal is reset:  - if the reference signal in the indicated TCI state or the SS/PBCH block which is QCLed with the reference signal in the indicated TCI state is updated.  ...  We think the above case is quite common due to the uncertainty of TCI state update indication to UE and first PUCCH transmission to NW, which needs to be fixed, i.e., introduce the status with pending or canceled of UEI report triggering as described in the first TP in 38.214. Consequently, the indication of the ‘1-bit’ condition met indicator for a new beam RS should be further interpreted as described in the second TP in 38.212.  **Proposal 1.4: Support**  It is intuitive that values 14-15 cannot be valid for L1 SS-RSRP and CSI-RSRP as per the specs. |
| MediaTek | **Issue 1.1:** Support Candidate#7 for now and support to stop the timer for all the new beam(s) when Canadidate#2 occurs.  First, we prefer to replace the “counting” in the proposal with ‘counter’ which aligns with the Spec.  Candidate#1: We only need to make the timers be not running (i.e., stop the timer) after RRC reconfiguration of new beam RS(s), as the counter(s) for the new beam RS(s) is increased only if the corresponding timer is running. We only accept a simple UE behavior that all the timers for new beam RS(s) shall be stopped after RRC reconfiguration of new beam RS(s), without requiring UE effort on identifying the newly added beam(s) first.  [Mod]: Capture your and OPPO’s suggestion as one candidate.  Candidate#3: We only accept a simple UE behavior that all the timers for new beam RS(s) shall be stopped after a UEI beam report is transmitted. There is no strong motivation to keep evaluating the other new beam(s) after the UE has suggested a satisfied beam for beam management.  Candidate#5: The equivalent UE behavior has been reflected in the current specification from our view, since the timer is considered as not running when the timer counts down to zero. When the UE further detects an event instance for the new beam RS whose timer is not running, then UE set the counter to one.  **Issue 1.2:** Fine with the TP  **Issue 1.3:** The equivalent UE behavior can be achieved by Candidate#3 in Issue 1.1.  **Issue 1.4:** Fine with the update. According to Table 10.1.6.1-1 in TS38.133, if IE value in *RSRP-Range* is equal to 14 or 15 for L1-RSRP mapping, that is not valid. |
| Google | **Proposal 1.1**: Support the proposal in general.  **Proposal 1.2**: Fine with the TP, but there is no text in 5.2.1.5.4.1b in the TP to reflect the Summary of change. Is it a typo or something else?  **Proposal 1.3 and 2.3B**: Not needed. SPEC is clear, whenever the counting number achieves one or a configured value, UE sends the UEIRI and corresponding scheduled or preconfigured PUSCH. Whether the current beam is changed after the transmission of UEIRI is not a matter.  **Proposal 1.4**: Support since it is also raised in our contribution. When RAN1 made the agreement in last meeting, RAN1 referred to the wrong valid range. It need to be corrected.  [Mod]: Captured! |
| Qualcomm | **Proposal 1.1**: We support Candidate #1 and #7. Candidate #3 looks unnecessary and may complicate the process, while Candidate #5 is redundant due to the timer-based event instance detection.  **Proposal 1.2**: We don’t support the proposal, with the position that Interpretation-1 aligns with the intended behavior. In accordance with previous meetings’ agreements, the current beam RS and new beam RSs should maintain the same RS type (SSB or CSI-RS) and periodicity, and remain in the same CC to ensure a fair comparison of the beam qualities. The same principle should apply to evaluating the qualities of the activated TCI states. Specifically, if the current beam RS is configured as SSB, comparisons across activated TCI states should also be based on the QCLed SSBs.  [Mod]: Sorry for misleading. Indeed, final version is aligned with Interpretation-1.  **Proposal 1.3**: We are generally supportive. But it is questionable whether it aligns with the scope of maintenance agenda. |
| Spreadtrum | **Proposal 1.1**: Support at least Candidate #1 for resetting the counting.  **Proposal 1.2**: Fine with the Interpretation-2, but the third change in the TP seems to not align with the Interpretation-2.  [Mod]: Sorry for misleading. Then intention of this TP is to align with Interpretation-1.  **Proposal 1.3 and 2.3B:** Do not support. There is no need to introduce a new behavior during the maintenance phase. It can be up to UE for UEI beam report transmission.  **Proposal 1.4**: Fine with this update. |
| CATT | **Proposal 1.1**: Support Candidate #1, Candidate #5, Candidate#7  **Proposal 1.2**: We agree with the proposal that Interpretation-2 is more aligned with the definition of Event-7. But the wording in the TP needs to be further checked since it seems to support the Interpretation-1 in the proposal.  [Mod]: Sorry for misleading. Then intention of this TP is to align with Interpretation-1.  **Proposal 1.3 and 2.3B:** Do not support. The proposal is not clear.  **Proposal 1.4**: Support and agree with Google’s assessment. When RAN1 made the agreement in last meeting, RAN1 referred to the wrong valid range.  BTW, in our contribution, we have proposed one TP that the current spec with respect to the resetting condition of the counter is not clear. For event-7, the condition should be the update of the q-th best RS in the activated TCI state instead of the RS of the indicated TCI state. The TP is re-presented here to hear opinions from other companies:  **Proposed TP for TS38.214:**   |  | | --- | | **5.2.1.5.4.1** UE Initiated CSI reporting  For a UE configured with a *CSI-ReportConfig* with *eventType* for periodic reference signals with the same periodicity configured by the *newBeamResourceSet*, without *eventDetectionTimeWindowLength,* and with *dl-OrJointTCI-StateList*, when an event instance is determined (as described in the following clauses),  - for a reference signal configured by the *newBeamResourceSet*, if *eventType* is set to ‘event2’ or ‘event7’, or  - for the reference signal in the indicated TCI state or the SS/PBCH block which is QCLed with the reference signal in the indicated TCI, if *eventType* is set to ‘event1’,  the UE transmits UEIRI on a PUCCH format 0 or format 1 in the PUCCH resource (in the CC provided by *pucchCell,* if configured, in the *CSI-ReportConfig*) configured by *PUCCHResource* in the *CSI-ReportConfig*.  For a UE configured with a *CSI-ReportConfig* with *eventType* for periodic reference signals with the same periodicity configured by the *newBeamResourceSet*, with *eventDetectionTimeWindowLength*, and with *dl-OrJointTCI-StateList,* when an event instance is determined (as described in the following clauses),  - for a reference signal configured by the *newBeamResourceSet*, if *eventType* is set to ‘event2’ or ‘event7’, or  - for the reference signal in the indicated TCI state or the SS/PBCH block which is QCLed with the reference signal in the indicated TCI, if *eventType* is set to ‘event1’,  the UE  - starts a timer for such reference signal from the initial value equal to the time window length provided by *eventDetectionTimeWindowLength* and sets the counter to 1,if the timer for such reference signal is not running; or  - increments the counter for such reference signal by 1, if the timer for such reference signal is running.  If the number of event instances determined by the counter for such reference signal is greater than or equal to *eventInstanceCount*, the UE transmits UEIRI on a PUCCH format 0 or format 1 in the PUCCH resource (in the CC provided by *pucchCell,* if configured, in the *CSI-ReportConfig*) configured by *PUCCHResource* in the *CSI-ReportConfig*.  The UE does not expect that a CSI trigger state associated with CSI report configuration(s) configured with the higher layer parameter *eventType* is further associated with other CSI report configurations that are not configured with the higher layer parameter *eventType*.  5.2.1.5.4.1a UE Initiated CSI reporting for event 2  For a UE configured with a *CSI-ReportConfig* with the higher layer parameter *eventType* set to ‘event2’, an event instance is determined for a reference signal configured by the *newBeamResourceSet*if the L1-RSRP value determined for a transmission occasion of such reference signal is an *eventThreshold* greater than the L1-RSRP value determined for a transmission occasion of  - the reference signal in the indicated TCI state (applied to the same CC of *CSI-ReportConfig* if *CCofIndicatedTCI* is not configured,or to the CC indicated by *CCofIndicatedTCI* in the *CSI-ReportConfig),* if *newBeamResourceSet* is a *NZP-CSI-RS-ResourceSet* configured with *repetition*, else  - the SS/PBCH block which is QCLed with the reference signal in the indicated TCI state (applied to the same CC of *CSI-ReportConfig* if *CCofIndicatedTCI* is not configured, or to the CC indicated by *CCofIndicatedTCI* in the *CSI-ReportConfig*)*,* if *newBeamResourceSet* is a *CSI-SSB-ResourceSet*.  After transmitting UEIRI, the UE reports, as defined in Clause 6.3.2.1.2 of [5, TS 38.212], in a single reporting instance *nrofReportedRS-UEIBR* CRIs or SSBRIs corresponding to reference signals provided by the *newBeamResourceSet* that comprise at least one reference signal that triggers the UEIRI transmission. For each CSI or SSBRI, the CSI report includes the absolute L1-RSRP or differential L1-RSRP and, when *PresenceOfConditionMetIndicator* is configured, condition met indicator indicating whether the reference signal indicated by reported CRI or SSBRI triggers the UEIRI transmission, and, when *enabledCurrentBeamReport* is configured, the differential L1-RSRP corresponding to the reference signal in the indicated TCI state, or to the SS/PBCH block which is QCLed with the reference signal in the indicated TCI state. The UE sends the CSI report  - on a PUSCH indicated by the DCI format 0\_1/0\_2 in a PDCCH reception if *reportTransmissionMode* is configured as ‘ModeA’ and the CSI trigger state associated with the *CSI-ReportConfig* is indicated in the CSI request field in the DCI format 0\_1/0\_2, or  - on a type 1 CG-PUSCH configured by *configuredPUSCHResourceOfModeB* in the same CC as the corresponding *CSI-ReportConfig,* on the first available transmission occasion *numOfSymbols-ModeB* symbols after the end of the transmitted PUCCH if *reportTransmissionMode* is configured as ‘ModeB’, where the periodicity of the PUCCH resource and type 1 CG-PUSCH resource is the same, *numOfSymbols-ModeB* is based on the numerology of the PUCCH resource with UEIRI transmitted, and the CG-PUSCH does not carry UL-SCH.  The reference signal in the indicated TCI state is the reference signal w.r.t. QCL-TypeD, if there are two QCL RSs in the indicated TCI state.  The UE does not expect that the reference signal in the indicated TCI state or the SS/PBCH block which is QCLed with the reference signal in the indicated TCI state is in a different CC from the reference signals configured by *newBeamResourceSet.*  For event 2, the counter of the event instances is reset:  - if the reference signal in the indicated TCI state or the SS/PBCH block which is QCLed with the reference signal in the indicated TCI state is updated.  5.2.1.5.4.1b UE Initiated CSI reporting for event 1  For a UE configured with a *CSI-ReportConfig* with the higher layer parameter *eventType* set to ‘event1’, an event instance is determined if the L1-RSRP value determined for a transmission occasion of  - the reference signal in the indicated TCI state (applied to the same CC of *CSI-ReportConfig* if *CCofIndicatedTCI* is not configured*,* or to the CC indicated by *CCofIndicatedTCI* in the *CSI-ReportConfig*), if *newBeamResourceSet* is a *NZP-CSI-RS-ResourceSet* configured with *repetition*, else  - the SS/PBCH block which is QCLed with the reference signal in the indicated TCI state (applied to the same CC of *CSI-ReportConfig* if *CCofIndicatedTCI* is not configured*,* or to the CC indicated by *CCofIndicatedTCI* in the *CSI-ReportConfig*), if *newBeamResourceSet* is a *CSI-SSB-ResourceSet*,  is lower than *eventThreshold-Event1.*  After transmitting UEIRI, the UE reports, as defined in Clause 6.3.2.1.2 of [5, TS 38.212], in a single reporting instance *nrofReportedRS-UEIBR* CRIs or SSBRIs corresponding to reference signals provided by the *newBeamResourceSet*. For each CRI or SSBRI, the CSI report includes the absolute L1-RSRP or differential L1-RSRPs, and, when *enabledCurrentBeamReport* is configured, the absolute L1-RSRPs, corresponding to the reference signal in the indicated TCI state, or to the SS/PBCH block which is QCLed with the reference signal in the indicated TCI state. The UE sends the CSI report  - on a PUSCH indicated by the DCI format 0\_1/0\_2 in a PDCCH reception if *reportTransmissionMode-r19* is configured as ‘ModeA’ and the CSI trigger state associated with the *CSI-ReportConfig* is indicated in the CSI request field in the DCI format 0\_1/0\_2, or  - on a type 1 CG-PUSCH configured by *configuredPUSCHResourceOfModeB* in the same CC as the corresponding *CSI-ReportConfig*, on the first available transmission occasion *numOfSymbols-ModeB* symbols after the end of the transmitted PUCCH if *reportTransmissionMode* is configured as ‘ModeB’, where the periodicity of the PUCCH resource and type 1 CG-PUSCH resource is the same, *numOfSymbols-ModeB* is based on the numerology of the PUCCH resource with UEIRI transmitted, and the CG-PUSCH does not carry UL-SCH.  The reference signal in the indicated TCI state is the reference signal w.r.t. QCL-TypeD, if there are two QCL RSs in the indicated TCI state.  The UE does not expect that the reference signal in the indicated TCI state or the SS/PBCH block which is QCLed with the reference signal in the indicated TCI state is in a different CC from the reference signals configured by *newBeamResourceSet.*  For event 1, the counter of the event instances is reset:  - if the reference signal in the indicated TCI state or the SS/PBCH block which is QCLed with the reference signal in the indicated TCI state is updated.  5.2.1.5.4.1c UE Initiated CSI reporting for event 7  For a UE configured with a *CSI-ReportConfig* with the higher layer parameter *eventType* set to ‘event7’, an event instance is determined for a reference signal configured by the *newBeamResourceSet* if the L1-RSRP value determined for a transmission occasion of such reference signal is an *eventThreshold* greater than the L1-RSRP value determined for a transmission occasion of  - the reference signal with the *valueOfQ* highest L1-RSRP out of the reference signals among the activated TCI states (applied to the same CC of *CSI-ReportConfig* if *CCofIndicatedTCI* is not configured*,* or to the CC indicated by *CCofIndicatedTCI* in the *CSI-ReportConfig*), if *newBeamResourceSet* is a *NZP-CSI-RS-ResourceSet* configured with *repetition*, else  - the SS/PBCH block with the *valueOfQ* highest L1-RSRP out of the SS/PBCH block s QCLed with the reference signals among the activated TCI states (applied to the same CC of *CSI-ReportConfig* if *CCofIndicatedTCI* is not configured*,* or to the CC indicated by *CCofIndicatedTCI* in the *CSI-ReportConfig*), if *newBeamResourceSet* is a *CSI-SSB-ResourceSet*.  After transmitting UEIRI, the UE reports, as defined in Clause 6.3.2.1.2 of [5, TS 38.212] in a single reporting instance *nrofReportedRS-UEIBR* CRIs or SSBRIs corresponding to reference signals provided by the *newBeamResourceSet* that comprise at least one reference signal that triggers the UEIRI transmission. For each CRI or SSBRI, the CSI report includes the absolute L1-RSRP or differential L1-RSRP and, when *PresenceOfConditionMetIndicator* is configured a condition met indicator indicating whether the reference signal indicated by reported CRI or SSBRI triggers the UEIRI transmission and, when *enabledCurrentBeamReport* is configured, the differential L1-RSRP corresponding to the reference signal with the *valueOfQ* highest L1-RSRP out of the activated TCI state reference signals, or to the SS/PBCH block which is QCLed with the reference signal with the *valueOfQ* highest L1-RSRP out of the activated TCI state reference signals. The UE sends the CSI report  - on a PUSCH indicated by the DCI format 0\_1/0\_2 in a PDCCH reception if *reportTransmissionMode* is configured as ‘ModeA’ and the CSI trigger state associated with the *CSI-ReportConfig* is indicated in the CSI request field in the DCI format 0\_1/0\_2, or  - on a type 1 CG-PUSCH configured by *configuredPUSCHResourceOfModeB* in the same CC as the corresponding *CSI-ReportConfig*, on the first available transmission occasion *numOfSymbols-ModeB* symbols after the end of the transmitted PUCCH if *reportTransmissionMode* is configured as ‘ModeB’, where the periodicity of the PUCCH resource and type 1 CG-PUSCH resource is the same, *numOfSymbols-ModeB* is based on the numerology of the PUCCH resource with UEIRI transmitted, and the CG-PUSCH does not carry UL-SCH.  The reference signal with the *valueOfQ-r19* highest L1-RSRP out of the activated TCI state reference signals is the reference signal w.r.t. QCL-TypeD, if there are two QCL RSs in such activated TCI state.  The UE does not expect that the reference signal with the *valueOfQ* highest L1-RSRP out of the activated TCI state reference signals is in a different CC from the reference signals configured by *newBeamResourceSet.*  For event 7, the counter of the event instances is reset:  - if the reference signal with the *valueOfQ* highest L1-RSRP out of the reference signals among the activated TCI states or the SS/PBCH block with the *valueOfQ* highest L1-RSRP out of the SS/PBCH block s QCLed with the reference signals among the activated TCI states is updated.  <unrelated parts are omitted> |   [Mod]: Good! But, per my assessment, the final TP may be up to the outcome of Issue 1.1. Then, when having the final outcome, I will try to provide the final draft TPs. |
| NEC | **Proposal 1.1**: in principle, we support the proposal.  **Proposal 1.2**: OK with the TP.  **Proposal 1.3 and 2.3B**: support to have a pending state.  **Proposal 1.4**: OK.  [Mod]: Captured! |
| Ericsson | Proposal 1.1: Support  Proposal 1.2: Support. But it looks like Interpretation 1 has been captured in the TP?  [Mod]: Correct!  Proposal 1.3: Support  Proposal 1.4: Support. Preferably captured in the field description in 38.331. |
| Panasonic | **Proposal 1.1:** We support Candidates #5 and #7 but not #3. Candidate #3 should be discussed in the context of retransmission expiry and can pertain to only one of modes A or B.  [Mod]: Captured!  **Issue 1.3:** We do not see this as a major issue that needs addressing. So, we do not support especially during maintenance phase. |
| Mod | Update the proposal per companies’ input.   * Note: For proposal 1.2, the intention is to captured #1! |
| Huawei, HiSilicon | **Proposal 1.1:** Needs modification  For Candidate#1, if a new beam is added by RS reconfiguration, there is no counting/timer for that new beam to reset/stops. So, Candidate#1 should only apply to the case that the new beam RS corresponding to a counter is removed from the new beam resource set by RRC reconfiguration.  [Mod]: A list of companies provided their concern. Even though not your preference, please check whether to accept the case of resetting for all new beams.  For candidate#5, one timer corresponds to one new beam only. So, if the timer expires, UE needs to stop the counter for “the new beam” not “those new beams”.  [Mod]: Done!  **Proposal 1.2:** We do not support the last change regarding SS/PBCH block. The current text is clearer. Other changes are OK.  **Proposal 1.3:** Not support. We are not sure we understand the condition for cancelling the pending report mentioned at the end of the TP: “if a CSI report including the reference signal in a reporting instance as defined in Clause 5.2.1.5.4.1a, 5.2.1.5.4.1b or 5.2.1.5.4.1c.”.  We think only if the TCI indicating DCI is received after transmitting UEIRI and before beam report transmission, the beam report should be dropped/cancelled and this can be captured with more straightforward and simpler TP as follows:    **Proposal 2.3B:** Not support. We are not sure this TP is trying to address which issue. Also, the pending report is not defined in this TP.  **Proposal 1.4:** Change is not required. |
| Appple | **Propoal 1.1:** Support except Candidate 7.  As it is overly broad and could lead to unnecessary resetting of event counters, which in turn increases event-triggering latency and risks radio link failure. Our recommendation is to list the two conditons in sub-bullet of Candidate 7 directly and remove the main bullet.  [Mod]: Okay. Done!  **Propoal 1.2:** Support to implement Interpretation 1. As commented by other companies, the ‘reason for change’ section needs to change as ‘Interpretation 1’.  **Proposal 1.3:** Not support. It is unclear what is the issue targetted by the TP.  **Proposal 1.4:** Ok. |
| Mod | Reformulate the candidate#7 in proposal 1.1, per Apple’s suggestion. |
| NTT DOCOMO | **Propoal 1.1: Support at least Candidate#1#7.**  Regarding Candidate#3, whether NW can re-indicate the UEIBR transmission should be further clarified when the second PUSCH on Mode A is not successfully received by NW and corresponding counter is reset. If such behavior cannot be allowed, we do not support Candidate#3 since it leads to the latency to wait next event satisfaction.  **Propoal 1.2: Support to implement Interpretation 1.**  **Proposal 1.3 and 2.3B: Support.**  **Proposal 1.4: Support.** |
| ETRI | **Propoal 1.1:** Support  **Propoal 1.2:** Support  **Propoal 1.3:** Support  **Propoal 1.5:** Support |
| Mod | Capture companies’ input. |

## Issue 2 – UL signaling content(s)

Table 2-1 Summary for Issue 2

|  |  |  |
| --- | --- | --- |
| **#** | **Issue** | **Companies’ view and Recommended Proposal** |
| 2.1 | L1-RSRP report format —— Reverting the agreement on differential RSRP | FL Note: Per companies input [22], as shown in the following figure, For UE-initiated/event-driven beam reporting according to Event-2,   * The new beam with the strongest reported L1-RSRP may not satisfy the condition of Event-2. * When the mandatory inclusion of the current beam in the report is enabled, even the current beam may be reported as the one with the strongest L1-RSRP.   To handle this issue, the following proposal is proposed. If agreed, the corresponding TP will be provided later. Of course, out of range indicator is another candidate [11].    **Proposal 2.1:** Regarding UE-initiated/event-driven beam reporting according to Event-2 and Event-7, if the current beam is configured to always be reported, down-select one of the following options:   * Option-1: An **absolute** L1-RSRP of the current beam should be reported; * Option-2: Introduce a new indication of out-of-range corresponding to the current beam * Option-3: No further enhancement.   Option-1: QC, Lenovo, ZTE, MediaTek, Ericsson, NTT DOCOMO,  Option-2: Ofinno, Panasonic  Option-3: OPPO, xiaomi, Google, Spreadtrum, CATT, NEC, Huawei, Apple, |
| 2.2 | Reference time unit for determining current beam | FL Note: Per companies input [9, 23], for the report format of carrying the current beam RSRP value, the time point of deriving the current beam is unclear, while considering dynamic update for TCI indication/activation. Therefore, the following clarification should be needed. Besides for event-detection procedure, per my assessment, any further restriction (e.g., the measured occasions for the current beam RS and the new beam RS(s) should be within the same periodicity) can be left to RAN4.  **Proposal 2.2:** Regarding UE-initiated/event-driven beam reporting, on both Mode-A and Mode-B, if the current beam is configured to always be reported, down-select one of the following options on the reference time for deriving the current beam RS in a report instance:   * Option-1:   + For a single CC case and for a UEI-BR carried in a second PUSCH of a CSI report configuration, the current beam RS is the same as the RS derived by the TCI state indicated in a latest PDCCH before a first PUCCH associated with the second PUSCH.   + For a multi-CC case and for a UEI-BR carried in a second PUSCH of a CSI report configuration, the current beam RS is the same as the RS derived by the TCI state, indicated in a latest PDCCH, for the serving cell of the new beam RS, where the latest PDCCH is before a first PUCCH associated with the second PUSCH. * Option-2: The current beam RS is the same as the RS derived by the indicated TCI state in the slot of the CSI reference resource corresponding to the report instance. * Option-3:   + For a single CC case and a UEI-BR carried in a second PUSCH of a CSI report configuration, the current beam RS is the same as the RS derived by the latest TCI state, applied [in a latest slot] before a first PUCCH associated with the second PUSCH.   + For a multi-CC case and a UEI-BR carried in a second PUSCH of a CSI report configuration, the current beam RS is the same as the RS derived by the latest TCI state, applied [in a latest slot] before a first PUCCH associated with the second PUSCH, for the serving cell of the new beam RS.   Option-1: Samsung  Option-2: ZTE, MediaTek, Google, Qualcomm, Spreadtrum, NEC, Ericsson, Apple, NTT DOCOMO,  Option-3: vivo, Lenovo, xiaomi, Fujitsu, |
| 2.3 | L1-RSRP report format —— Capturing the condition of differential RSRP | FL Note: Per companies input [9], the condition of differential RSRP report does not captured.  **Proposal 2.3:** Adopt the following changes in Clause 5.2.1.5.4 in TS38.214.   * **Reason for change:** The agreed condition of differential RSRP report and corresponding reference of differential value are not specified. * **Summary of change:**    + Clarify the condition of reporting differential L1-RSRP.   + Clarify the reference of deriving the differential RSRP in a report instance. * **Consequences if not approved:** The report format and corresponding definition of corresponding differential L1-RSRP field is incomplete, regarding event-1/2/7.  |  | | --- | | 5.2.1.5.4.1a UE Initiated CSI reporting for event 2  <Unchanged parts are omitted>  After transmitting UEIRI, the UE reports, as defined in Clause 6.3.2.1.2 of [5, TS 38.212], in a single reporting instance *nrofReportedRS-UEIBR* CRIs or SSBRIs corresponding to reference signals provided by the *newBeamResourceSet* that comprise at least one reference signal that triggers the UEIRI transmission. For each CSI or SSBRI, the CSI report includes the absolute L1-RSRP if *nrofReportedRS-UEIBR* is configured to be one, or absolute L1-RSRP for first CRI/SSBRI and differential RSRP for the rest if *nrofReportedRS-UEIBR* is configured to be larger than one~~or differential L1-RSRP and,~~ when *PresenceOfConditionMetIndicator* is configured, condition met indicator indicating whether the reference signal indicated by reported CRI or SSBRI triggers the UEIRI transmission, and, when *enabledCurrentBeamReport* is configured, the differential L1-RSRP corresponding to the reference signal in the indicated TCI state, or to the SS/PBCH block which is QCLed with the reference signal in the indicated TCI state. The differential L1-RSRP values are with a reference to the largest measured L1-RSRP value which is part of the same L1-RSRP reporting instance. The UE sends the CSI report  <Unchanged parts are omitted>  5.2.1.5.4.1b UE Initiated CSI reporting for event 1  <Unchanged parts are omitted>  After transmitting UEIRI, the UE reports, as defined in Clause 6.3.2.1.2 of [5, TS 38.212], in a single reporting instance *nrofReportedRS-UEIBR* CRIs or SSBRIs corresponding to reference signals provided by the *newBeamResourceSet*. For each CRI or SSBRI, the CSI report includes the absolute L1-RSRP if *nrofReportedRS-UEIBR* is configured to be one, or absolute L1-RSRP for first CRI/SSBRI and differential RSRP for the rest if *nrofReportedRS-UEIBR* is configured to be larger than one~~or differential L1-RSRPs and,~~, when *enabledCurrentBeamReport* is configured, the absolute L1-RSRPs, corresponding to the reference signal in the indicated TCI state, or to the SS/PBCH block which is QCLed with the reference signal in the indicated TCI state. The differential L1-RSRP values are with a reference to the largest measured L1-RSRP value which is part of the same L1-RSRP reporting instance. The UE sends the CSI report  <Unchanged parts are omitted>  5.2.1.5.4.1c UE Initiated CSI reporting for event 7  <Unchanged parts are omitted>  After transmitting UEIRI, the UE reports, as defined in Clause 6.3.2.1.2 of [5, TS 38.212] in a single reporting instance *nrofReportedRS-UEIBR* CRIs or SSBRIs corresponding to reference signals provided by the *newBeamResourceSet* that comprise at least one reference signal that triggers the UEIRI transmission. For each CRI or SSBRI, the CSI report includes the absolute L1-RSRP if *nrofReportedRS-UEIBR* is configured to be one, or absolute L1-RSRP for first CRI/SSBRI and differential RSRP for the rest if *nrofReportedRS-UEIBR* is configured to be larger than one~~or differential L1-RSRP and,~~, when *PresenceOfConditionMetIndicator* is configured a condition met indicator indicating whether the reference signal indicated by reported CRI or SSBRI triggers the UEIRI transmission and, when *enabledCurrentBeamReport* is configured, the differential L1-RSRP corresponding to the reference signal with the *valueOfQ* highest L1-RSRP out of the activated TCI state reference signals, or to the SS/PBCH block which is QCLed with the reference signal with the *valueOfQ* highest L1-RSRP out of the activated TCI state reference signals. The differential L1-RSRP values are with a reference to the largest measured L1-RSRP value which is part of the same L1-RSRP reporting instance. The UE sends the CSI report  <Unchanged parts are omitted> |   Supported by: Samsung, OPPO, vivo, Lenovo, Ofinno, Fujitsu, ZTE, Qualcomm, NEC, Ericsson, Apple, NTT DOCOMO,  Not supported by: MediaTek, Google, Spreadtrum, Huawei, |

Table 2-2 Company input for Issue 2

|  |  |
| --- | --- |
| **Company** | **Input** |
| Mod V00 | * Please input your comment/preference to those proposals and questions on the issue 2.1~2.3, if needed. |
| OPPO | 2.1: The reality is the current design of event 7 does not work. To make event-7, the enhancement proposed in 2.1 (i.e., Option 1 and 2) does not solve the issue. Thus for 2.1, we support Option-3.  2.2: The definition of ‘current beam’ in a UEIBM reporting instance is not clear. The root cause for that is there could be TCI state switch between the event triggering and the transmission of the UEIBM. However, the wording in both Option 1 and Option 2 are not clear.  **Updated Proposal 2.2:** Regarding UE-initiated/event-driven beam reporting, on both Mode-A and Mode-B, if the current beam is configured to always be reported, down-select one of the following options on the reference time for deriving the current beam RS in a report instance:   * Option-1:   + For ~~a single CC case and for~~ a UEI-BR carried in a second PUSCH of a CSI report configuration, ~~the current beam RS is the same as the RS derived by the TCI state indicated in a latest PDCCH before a first PUCCH associated with the second PUSCH.~~   + ~~For a multi-CC case and for a UEI-BR carried in a second PUSCH of a CSI report configuration~~, the current beam RS is the same as the RS derived by the TCI state, indicated in a latest PDCCH, for the serving cell of the new beam RS, where the latest PDCCH is before a first PUCCH associated with the second PUSCH. * Option-2: The current beam RS is the same as the RS derived by the indicated TCI state in the slot of the CSI reference resource corresponding to the report instance. * Option-3: the current indicated TCI state.   [Mod]: In technical, your update for Option-1 seems reasonable, but proponents may have different view. So, let’s keep the original wording for now.  2.3: ok |
| vivo | **Proposal 2.2**: As TCI state indicated in the PDCCH is applied by UE after beam application time, the TCI state indication in the latest PDCCH before the first PUCCH may not be the TCI state used for event evaluation. Therefore, it is more reasonable that the current beam RS to be reported is the reference signal/SSB associated with the latest TCI state applied before the first PUCCH associated with the second PUSCH, i.e., Option-3 in the following updated proposal.  **Updated Proposal 2.2:** Regarding UE-initiated/event-driven beam reporting, on both Mode-A and Mode-B, if the current beam is configured to always be reported, down-select one of the following options on the reference time for deriving the current beam RS in a report instance for event-1and event-2:   * Option-1:   + For a single CC case and for a UEI-BR carried in a second PUSCH of a CSI report configuration, the current beam RS is the same as the RS derived by the TCI state indicated in a latest PDCCH before a first PUCCH associated with the second PUSCH.   + For a multi-CC case and for a UEI-BR carried in a second PUSCH of a CSI report configuration, the current beam RS is the same as the RS derived by the TCI state, indicated in a latest PDCCH, for the serving cell of the new beam RS, where the latest PDCCH is before a first PUCCH associated with the second PUSCH. * Option-2: The current beam RS is the same as the RS derived by the indicated TCI state in the CSI reference resource corresponding to the report instance. * Option-3:   + For a single CC case and a UEI-BR carried in a second PUSCH of a CSI report configuration, the current beam RS is the same as the RS derived by the latest TCI state, applied before a first PUCCH associated with the second PUSCH.   + For a multi-CC case and a UEI-BR carried in a second PUSCH of a CSI report configuration, the current beam RS is the same as the RS derived by the latest TCI state, applied before a first PUCCH associated with the second PUSCH, for the serving cell of the new beam RS.   **Proposal 2.3**: Ok  [Mod]: Captured! |
| Lenovo | **Proposal 2.1:** Support Option 1.  **Proposal 2.2:** We tend to agree that a mechanism is needed to determine the ‘current beam’ for the L1-RSRP calculation for reporting. The issue for option-1 is that the indicated TCI state by the latest PDCCH before a first PUCCH may not be applied before the first PUCCH or even before the second PUSCH considering the BAT. But, based on our understanding, the current beam RSRP should based on an applied indicated TCI state. Thus, we add a new option 3 as follows:  **Updated Proposal 2.2:** Regarding UE-initiated/event-driven beam reporting, on both Mode-A and Mode-B, if the current beam is configured to always be reported, down-select one of the following options on the reference time for deriving the current beam RS in a report instance:   * Option-1:   + For a single CC case and for a UEI-BR carried in a second PUSCH of a CSI report configuration, the current beam RS is the same as the RS derived by the TCI state indicated in a latest PDCCH before a first PUCCH associated with the second PUSCH.   + For a multi-CC case and for a UEI-BR carried in a second PUSCH of a CSI report configuration, the current beam RS is the same as the RS derived by the TCI state, indicated in a latest PDCCH, for the serving cell of the new beam RS, where the latest PDCCH is before a first PUCCH associated with the second PUSCH. * Option-2: The current beam RS is the same as the RS derived by the indicated TCI state in the CSI reference resource corresponding to the report instance. * Option-3:   + For a single CC case and for a UEI-BR carried in a second PUSCH of a CSI report configuration, the current beam RS is the same as the RS derived by the indicated TCI state which is applied in a latest slot before a first PUCCH associated with the second PUSCH.   + For a multi-CC case and for a UEI-BR carried in a second PUSCH of a CSI report configuration, the current beam RS is the same as the RS derived by an indicated TCI state for the serving cell of the new beam RS, where the indicated TCI state is applied in the latest slot before a first PUCCH associated with the second PUSCH.   [Mod]: It seems that you have the same views as vivo. Merged!  **Proposal 2.3:** Support. |
| Samsung | **Proposal 2.1**: Option-1/2 would not work for current formulation of Event-7. This is because for Event-7, it is unclear whether multiple “current” beam RSs are allowed to be determined for event evaluation with respect to a same timer/time window because the Q-th best quality hence the corresponding “current” beam RS may change from one measurement occasion to another – if multiple “current” beam RSs are determined, it is unclear whether to report L1-RSRP(s) of one or some or all of them (and how to report). It is naturally to determine only one “current” beam RS for Event-7 evaluation for a same timer/time window, which also reuses the same design as Event-2.  Hence, we propose to first clarify that for a same timer/time window, the UE would only apply one same “current” beam RS for event evaluations; and for simplicity, the fixed “current” beam RS can be that used for starting the corresponding timer/time window – or equivalently that used for determining the (first) event instance that starts the timer/time window.  **Proposal:** *Regarding determining Event-7 instance(s) within a timer/time window, support to only use the “current” beam RS with the Q-th best quality that determines the event instance that starts the timer/time window.*  [Mod]: Let’s focus on the report format firstly.  **Proposal 2.2**: first of all, we think we only need to clarify which indicated TCI state the UE needs to refer to for deriving current beam RS for event evaluation. So for single-CC case, the current beam RS should correspond to the RS in the TCI state indicated by/in the latest received beam indication DCI before the corresponding PUCCH transmission (similar design can be applied to multi-CC case). Hence we support Option-1. Option-2 is not needed, and Option-3 is unclear about how to determine this indicated TCI state.    **Proposal 2.3**: support |
| Xiaomi | Proposal 2.1: we prefer option-3 and differential L1-RSRP can be indicated to 0 if L1-RSRP of current beam is not worse than the strongest one.  Proposal 2.2: since the indicated TCI state can also be indicated by MAC CE, we suggest the following update for Option-1:  the current beam RS is the same as the RS derived by the TCI state indicated before a first PUCCH associated with the second PUSCH.  [Mod]: If ‘in a last PDCCH’ is removed, it is the same as Option3.  Proposal 2.3: fine with the principle and suggest the version as ‘The differential L1-RSRP values are with a reference to the absolute L1-RSRP which is part of the same L1-RSRP reporting instance’ |
| Ofinno | **Proposal 2.1:**  Support Option-2.  Option-1 requires reverting following agreement which is highly undesirable and should only be done when absolutely necessary.   |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **[118] Agreement**  On UE-initiated/event-driven beam reporting, regarding L1-RSRP report format Option-3 depending on Event-2, the following differential L1-RSRP report format is supported.   |  | | --- | | CRI or SSBRI #1 | | CRI or SSBRI #2 | | … | | CRI or SSBRI #N | | L1-RSRP #1 | | Differential L1-RSRP #2 | | … | | Differential L1-RSRP #N | | Differential L1-RSRP for current beam, if report mode that current beam is always reported is enabled by RRC | | Note: Other contents are not precluded |   .   * + - Differential L1-RSRP #2~#N/current beam is determined based on the difference between measured L1-RSRP corresponding to the CRI/SSBRI #2~#N/current beam and the measured L1-RSRP corresponding to CRI/SSBRI #1       * L1-RSRP#1 is the largest measured RSRP among reported ones, and an absolute L1-RSRP.       * FFS: range and step size of differential L1-RSRP     - FFS: Whether/how to report additional indication of which CRI/SSBRI(s) satisfy the condition of Event-2.     - FFS: Additional report content(s) (e.g., reporting configuration ID, indication for synchronization state, event ID, or cell ID). |   The motivation of event-2 and event-7 is to let gNB know whether current beam is worse than the new beam(s) therefore needs to be changed. Introducing 1-bit indicator notifying whether current beam is the best or not already supports it.  **Proposal 2.2:**  In our view, once proposal 1.3 is agreed, we do not think this proposal is needed.  **Proposal 2.3:**  Support. |
| Fujitsu | **Proposal 2.2**: We are fine with the principle of Option-1. However, the wording “TCI state indicated in a latest PDCCH” may not be accurate. This is because, for unified TCI, “a TCI state indicated in a PDCCH” will be valid and applicable after beam application time. Therefore, the TCI state indicated in a latest PDCCH before a first PUCCH may not be applicable before the first PUCCH. To be more accurate, the following modifications are suggested.   * Option-1:   + For a single CC case and for a UEI-BR carried in a second PUSCH of a CSI report configuration, the current beam RS is the same as the RS derived by the ~~TCI state indicated in a~~ latest indicated TCI state ~~PDCCH~~ before a first PUCCH associated with the second PUSCH.   + For a multi-CC case and for a UEI-BR carried in a second PUSCH of a CSI report configuration, the current beam RS is the same as the RS derived by the ~~TCI state, indicated in a~~ latest indicated TCI state ~~PDCCH~~, for the serving cell of the new beam RS, where the latest indicated TCI state ~~PDCCH~~ is before a first PUCCH associated with the second PUSCH.   [Mod]: Option3, right?  **Proposal 2.3**: OK. |
| ZTE | **Proposal 2.1: Support Option-1**  This issue is valid in our understanding, and Option-1 is the straightforward way and also can reach out the unified design among Event-1, Event-2 and Event-7 in terms of that L1-RSRP of current beam is absolute L1-RSRP for Event-1.  **Proposal 2.2: Support Option-2**  Firstly, it is worth noticing that this is to address the same issue as Issue 1.3, we don’t see the necessity to specify two things to address the same issue. Based on the following agreement, it can be noted the determination of CSI reference resource for both Mode-A and Mode-B is already clear enough. In this sense, Option-1 is not needed while Option-2 is same to the following agreement.   |  | | --- | | **Agreement (RAN1#122)**  On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding CSI reference resource definition for a UEI beam report, the CSI reference resource for a CSI reporting is defined by a single downlink slot*,* where slot n is determined according to the uplink slot *n’* in which the second PUSCH is transmitted, and   * For mode-A, the legacy CSI reference definition of aperiodic CSI reporting is used. * For mode-B, *nCSI\_ref* is the smallest value greater than or equal to , such that slot *n*- *nCSI\_ref* corresponds to a valid downlink slot, where *Z'* corresponds to the delay requirement as defined in Clause 5.4.   In the report, a condition met indicator for new beam RS is determined according to the measurement(s) triggering the first PUCCH transmission.  Note: Strong concern was raised by vivo on the necessity of the above proposal especially considering the RAN4 status. |   **Proposal 2.3: Support.**  It is valid clarification in our understanding. |
| MediaTek | **Issue 2.1:** Support Option-1.  **Issue 2.2:** Option-2 is our understanding.  The time-domain CSI reference resource for a CSI report is the reference time to determine L1-RSRP and RS ID to be reported (i.e., the RS ID corresponding to the current beam RS)  **Issue 2.3:** Not needed.  The corresponding UE behavior for L1-RSRP determination has been defined in Clause 5.2.1.4.3 in TS38.214 which applies to all the CSI reports for L1-RSRP reporting (including UEI CSI reporting).  [Mod]: Initially I have the same views as you mentioned. But, after checking the current spec, there is no citing/reference between them. |
| Google | **Proposal 2.1**: Option-3  **Proposal 2.2**: Lean to Option-2. Option-1 seems unclear. Even the latest PDCCH is before the first PUCCH, the beam application time may be beyond the first PUCCH. Then, how to define the current beam.  **Proposal 2.3**: Not needed. We think the intention is already reflected in TS 38.212, where only the second/third/fourth RSRP is differential RSRP, if reported.  [Mod]: Captured! |
| Qualcomm | **Proposal 2.1**: We support Option-1. The issue was identified during RAN1 #121 in the discussion regarding the CSI reference resource. Since the CSI reference resource has been agreed, it is the right time to address the issue. Between Option-1 and Option-2, Option-1 is preferred because it allows “unified design for all Event types”, which aligns with the design principle established during Rel-19 discussion.  **Proposal 2.2**: To ensure fairness in measurement and reporting, the same CSI reference resource should be applied for both current and new beams. Thus, we support Option-2.  **Proposal 2.3**: We support the proposal.  [Mod]: Captured! |
| Spreadtrum | **Proposal 2.1**: Support Option-3.  **Proposal 2.2**: Fine with Option-2. For Option-1, the beam application time is not considered, which leads to an unclear behavior for current beam determination.  **Proposal 2.3**: It seems not necessary.  [Mod]: Captured! |
| CATT | **Proposal 2.1**: Support Option-3.  **Proposal 2.2**: Not necessary. The definition of indicated TCI is clear.  **Proposal 2.3**: Open to discuss.  [Mod]: Captured! |
| NEC | **Proposal 2.1**: Support Option-3. There is no need to revert the agreement.  **Proposal 2.2**: Support Option-2.  **Proposal 2.3**: OK  [Mod]: Captured! |
| Ericsson | Proposal 2.1: Support option-1  Proposal 2.2: Support option-2. But it feels like a corner case  Proposal 2.3: OK in principle. But both changes are inaccurate.  The first change is incorrect: it states that differential RSRP is always reported if *nrofReportedRS-UEIBR* is configured to be larger than one and that is incorrect: If *nrofReportedRS-UEIBR* is configured to be larger than one, absolute L1-RSRP is reported for one SSBRI/CRI and differential for the rest. The text used for regular reporting is accurate.  For the second change, we use “measured” RSRP in legacy, to avoid truncation effects. We propose to use that here as well  [Mod]: Captured! |
| Panasonic | Proposal 2.1: We can discuss but at this stage, we think that even when the new beam with the strongest reported L1-RSRP may not satisfy the condition of Event-2, that’s not an issue either. The extra flag indication is optional in first place. |
| Mod | Update per companies. For Proposal 2.3, please review the re-formulated proposal per companies’ input. |
| Huawei, HiSilicon | **Proposal 2.1:** Option-3. The issue that this Proposal is trying to address is a corner case.  Even if in the last measurement occasion of the beams, the current beam has the highest RSRP, UE does not need to report that value. It is up to UE how to filter the measurements for each beam and calculate the corresponding RSRP. In particular, we find Xiaomi’s suggestion simple and functional: The intention of option-1 and 2 is to tell gNB that the current beam is better than all new beams and gNB don’t need to do serving beam switch. This can be realized by setting the differential RSRP of the current beam to be 0. When gNB find the current beam has the same RSRP as the best new beam, the gNB wont switch the serving beam.  **Proposal 2.2:** We are open to discuss the proposal. However, we are not sure why the proposal tries to address the time point of deriving the current beam only for the case that the current beam is configured to always be reported. In any case, the current beam measurement is necessary even if it is not reported.  [Mod]: First step is to handle the interpretation of current beam in the report format herein.  **Proposal 2.3:** We think such clarification is unnecessary. It is clear that differential values are provided with respect to an absolute value in the same report. Also, if there is only one RSRP to report, differential value reporting does not make sense. |
| Apple | **Proposal 2.1: Support Opt.3.**  For UEIBR Event-2 and Event-7, the RS with the highest L1-RSRP is always included in the CSI report and serves as the basis for differential encoding, even when it does not meet the event triggering condition. To trigger the UEIBR report, the L1-RSRP of current beam should not be larger than the ‘Strongest’ L1-RSRP in the CSI report; Otherwise, event would not be triggered.  **Proposal 2.2: Opt.2.** The ending time for CSI report consturction is based on the timing of CSI Reference resource, which should be also used for current beam L1-RSRP computation.  **Proposal 2.3: Ok in principle**. Support changes proposed by Ericsson. |
| Mod | Capture companies’ input. |
| NTT DOCOMO | **Proposal 2.1: Support Opt.1.**  As we discussed so far, the L1-RSRP of the current beam could be larger than that of new beams even for Event-2/7. Then, 1-bit condition met indicator is included. In the sense, we should naturally consider the enhancement for this issue.  **Proposal 2.2: Support Opt.2.**  **Proposal 2.3: We are generally fine**. |
| ETRI | **Proposal 2.1:** SupportOption-3  **Proposal 2.2:** Support option-2  **Proposal 2.3:** Okay |
| Mod | Capture companies’ input. |

## Issue 3 – UL signaling medium/container

Table 3-1 Summary for Issue 3

|  |  |  |
| --- | --- | --- |
| **#** | **Issue** | **Companies’ view and Recommended Proposal** |
| 3.1.1 | First PUCCH for Mode-A and Mode-B —— multiplexing and/or dropping rule on Case-2: the 1-bit first PUCCH is collided/overlapped with a PUSCH | **[121] Agreement**  On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the multiplexing/dropping rule(s) of 1-bit first PUCCH, support **Option-3** of the following rules for the Case-2: the 1-bit first PUCCH is collided/overlapped with a PUSCH   * Option-3: Piggyback 1-bit indication of first PUCCH into the PUSCH.   + The 1-bit indication is always multiplexed in the PUSCH, regardless that UEI beam report procedure is triggered.   FL Note: Per companies input, the details on the multiplexing rule is unclear. Then, first of all, we may need to clarify the format of this 1-bit indication (e.g., reusing a bit sequence corresponding to each of collided 1-bit indication or a multiplexing rule of a field of ⌈log\_2 (L+1)⌉ bits of representing at most one of positive UEIRI. Then, whether/how to perform the joint encoding ‘1-bit indication’ with other UCI should be clarified.  **Proposal 3.1.1A:** On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the multiplexing a number of L (L>=1) first PUCCH(s) with UEIRIs collided/overlapped with a PUSCH, down select one of the following options:   * Option-1: A field of bit sequence with a length of L bit is piggyback into the PUSCH.   + Each of bits in the bit sequence corresponds to respective first PUCCH(s) by an ascending order of the values of PUCCH resource ID associated with the first PUCCHs. * Option-2: A field of bits of representing at most one of positive UEIRI   + The codepoints other than all-zero value in the field are ordered ~~is generated~~ based on an ascending order of the values of PUCCH resource ID associated with the first PUCCHs to represent a positive UEIBR.   + An all-zero value for the bits represents a UEIRI value across all ~~LRR/SRs and/or~~ *L* UEIRIs.   Option-1: ZTE, OPPO, vivo, Google, Qualcomm, Spreadtrum, NEC, Ericsson, Apple, NTT DOCOMO, ETRI,  Option-2: Huawei/Hisi’, Lenovo, Samsung, xiaomi, Ofinno, Fujitsu, MediaTek, CATT,  **Proposal 3.1.1B:** On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the multiplexing first PUCCH(s) with UEIRIs collided/overlapped with a PUSCH, down select one of the following options:   * Option-1: The field of UEIRI is jointly encoded with HARQ-ACK by appending the UEIRI to the HARQ-ACK information bits.   + UE expects that at most one of CG-UCI, UTO-UCI, or UEIRI to overlap with the PUSCH.   + Note: Multiplexing between first PUCCH and PUSCH is realized by replacing CG-UCI with the UEIRI in the first PUCCH. * Option-2: The field of UEIRI is jointly encoded with CSI Part-1 by adding the UEIRI before CSI part-1 information bits.   + Note: Multiplexing between first PUCCH and PUSCH is realized by assuming UEIRI as one type of CSI part-1.   Option-1: Huawei/Hisi’, Samsung, vivo, Lenovo, Ofinno, MediaTek, Google, Spreadtrum, CATT, Apple, NTT DOCOMO,  Option-2: ZTE, OPPO, xiaomi, Fujitsu, Qualcomm, NEC, ETRI,  FL Note: Besides, one more alignment TP from [5] is provided per the agreement.  **Proposal 3.1.1C:** Adopt the following changes in TS38.213 Section 9:   * **Reason for change:** In RAN1 #121 meeting, it was agreed that for UE-initiated/event-driven beam reporting, when the 1-bit first PUCCH is collided/overlapped with a PUSCH, the 1-bit first PUCCH is multiplexed in the PUSCH. This agreement has not been captured in TS38.213 currently. * **Summary of change:** Capture the agreement that for UE-initiated/event-driven beam reporting, when the 1-bit first PUCCH is collided/overlapped with a PUSCH, the 1-bit first PUCCH is multiplexed with PUSCH in TS38.213. * **Consequences if not approved:** The UE behavior in UE-initiated/event-driven beam reporting is not clear when the 1-bit first PUCCH is collided/overlapped with a PUSCH  |  | | --- | | **9 UE procedure for reporting control information**  <unrelated parts are omitted>  In the remaining of this clause, if a UE is provided *subslotLengthForPUCCH* for a cell for PUCCH transmission, a slot for an associated PUCCH resource of a PUCCH transmission with HARQ-ACK information on the cell includes a number of symbols indicated by *subslotLengthForPUCCH*, unless stated otherwise.  If a UE would transmit on a serving cell a PUSCH without UL-SCH that overlaps with a PUCCH transmission on a serving cell that includes positive SR information, the UE does not transmit the PUSCH.  If a UE would transmit CSI reports on overlapping physical channels, the UE applies the priority rules described in [6, TS 38.214] for the multiplexing of CSI reports.  If a UE  - would multiplex UCI in a PUCCH transmission that overlaps with a PUSCH transmission, and  - the PUSCH and PUCCH transmissions fulfil the conditions in clause 9.2.5 for UCI multiplexing,  the UE  - multiplexes only HARQ-ACK information, UEIRI, if any, from the UCI in the PUSCH transmission and does not transmit the PUCCH if the UE multiplexes aperiodic or semi-persistent CSI reports in the PUSCH;   * multiplexes only HARQ-ACK information, UEIRI and CSI reports, if any, from the UCI in the PUSCH transmission and does not transmit the PUCCH if the UE does not multiplex aperiodic or semi-persistent CSI reports in the PUSCH.   <unrelated parts are omitted> |   Supported by CATT, OPPO, vivo, Lenovo, xiaomi, Ofinno, Fujitsu, ZTE, MediaTek, Google, Qualcomm, Spreadtrum, CATT, NEC, ETRI,  Not supported/Postponed by: Samsung, Ericsson, Huawei, Apple, NTT DOCOMO, |
| 3.1.2 | First PUCCH for Mode-A and Mode-B —— multiplexing and/or dropping | FL Note: Per companies input [6, 7, 24, 26], .in TS38.213, the case where one of the UEIBRs is a positive UEIBR is absent when the PUCCH resource for UE-initiated/event-driven beam reporting is collided/overlapped with a PUCCH format 2/3/4 carrying CSI/SR. To align with the agreement, the following TP is proposed  **Proposal 3.1.2:** Adopt the following changes in TS38.213 Section 9.2.5.1:   * **Reason for change:** In the last meeting, when the PUCCH resource for UE-initiated/event-driven beam reporting is collided/overlapped with a PUCCH format 2/3/4 carrying CSI/SR, the following multiplexing rule was agreed. However, in the current specification, only the priority rule of LRR, UEIRI and normal SR is captured when the PUCCH resource for UE-initiated/event-driven beam reporting is collided/overlapped with a PUCCH format 2/3/4 carrying CSI/SR. * **Summary of change:** In TS38.213 section 9.2.5.1, add the case of no positive LRR and at least one positive UEIBRs to the multiplexing rule of PUCCH with UEIBR. * **Consequences if not approved:** UE behavior is unclear for the case of no positive LRR and at least one positive UEIBRs, when the PUCCH resource for UE-initiated/event-driven beam reporting is collided/overlapped with a PUCCH format 2/3/4 carrying CSI/SR.  |  | | --- | | **9.2.5.1 UE procedure for multiplexing HARQ-ACK or CSI and SR in a PUCCH**  < Unchanged parts are omitted >  If a UE would transmit a PUCCH with HARQ-ACK information bits in a resource using PUCCH format 2 or PUCCH format 3 or PUCCH format 4 in a slot, as described in clauses 9.2.1 and 9.2.3, bits representing a negative or positive SR/UEIRI, in ascending order of the values of *schedulingRequestResourceId*,a *schedulingRequestResourceId* associated with *schedulingRequestID-BFR-SCell*, a *schedulingRequestResourceId* associated with *schedulingRequestID-BFR,* a *schedulingRequestResourceId* associated with *schedulingRequestID-BFR2* if the UEprovides *twoLRRcapability*, and a *schedulingRequestResourceId* associated with *schedulingRequestID-LBT-SCell* for SR, and then in ascending order of the values of *pucch-ResourceId* for UEIRI, are appended to the HARQ-ACK information bits and the UE transmits the combined UCI bits in a PUCCH using a resource with PUCCH format 2 or PUCCH format 3 or PUCCH format 4 that the UE determines as described in clauses 9.2.1 and 9.2.3. If one of the SRs is a positive LRR, the value of the bits indicates the positive LRR; else, if one of the UEIRIs is a positive UEIRI, the value of the bits indicates the positive UEIRI. An all-zero value for the bits represents a negative SR/UEIRI value across all SRs and UEIRIs.  If a UE would transmit a PUCCH with  CSI report bits in a resource using PUCCH format 2 or PUCCH format 3 or PUCCH format 4 in a slot, bits representing corresponding negative or positive SR/UEIRI, in ascending order of the values of *schedulingRequestResourceId*, a *schedulingRequestResourceId* associated with *schedulingRequestID-BFR-SCell*, a *schedulingRequestResourceId* associated with *schedulingRequestID-BFR,* a *schedulingRequestResourceId* associated with *schedulingRequestID-BFR2* if the UEprovides *twoLRRcapability*, and a *schedulingRequestResourceId* associated with *schedulingRequestID-LBT-SCell* for SR, and then in ascending order of the values of *pucch-ResourceId* for UEIRI, are prepended to the CSI information bits as described in clause 9.2.5.2 and the UE transmits a PUCCH with the combined UCI bits in a resource using the PUCCH format 2 or PUCCH format 3 or PUCCH format 4 for CSI reporting. If one of the SRs is a positive LRR, the value of the bits indicates the positive LRR; else, if one of the UEIRIs is a positive UEIRI, the value of the bits indicates the positive UEIRI. An all-zero value for the bits represents a negative SR/UEIRI value across all SRs and UEIRIs. |   Supported by vivo, NTT DOCOMO, xiaomi, google, OPPO, Lenovo, Samsung, Ofinno, Fujitsu, ZTE, MediaTek, Qualcomm, Spreadtrum, CATT, Ericsson, Huawei, Apple, ETRI, |
| 3.1.3 | First PUCCH for Mode-A and Mode-B ——multiplexing and/or dropping rule on Case-4: the 1-bit first PUCCH is collided/overlapped with a PUCCH format 2/3/4 carrying HARQ/CSI/SR | FL Note: Per companies input [2], [4], reusing the legacy SR multiplexing rule for collision handling between first PUCCH and PUCCH format 0/1 for HARQ-ACK may lead to some ambiguities, especially in case of UEIRI or SR is positive and where first PUCCH resource, PUCCH resource for SR and PUCCH resource for HARQ-ACK are overlapped to each other. To handle that, we need to Option-1: introduce additional resource selection or Option-2: a rule of precluding such case.  **Proposal 3.1.3 (Option-1):**  Adopt the following changes in TS38.213 Section 9.2.5.1:   |  | | --- | | 9.2.5.1 UE procedure for multiplexing HARQ-ACK or CSI and SR in a PUCCH <Irrelevant part is omitted>  If a UE would transmit a PUCCH with positive SR and at most two HARQ-ACK information bits in a resource using PUCCH format 0, the UE transmits the PUCCH in the resource using PUCCH format 0 in PRB(s) for **HARQ-ACK information** as described in clause 9.2.3. The UE determines a value of and for computing a value of cyclic shift [4, TS 38.211] where is provided by *initialCyclicShift* of *PUCCH-format0*, and is determined from the value of one HARQ-ACK information bit or from the values of two HARQ-ACK information bits as in Table 9.2.5-1 and Table 9.2.5-2, respectively.  If the UE would transmit negative SR/UEIRI and a PUCCH with at most two HARQ-ACK information bits in a resource using PUCCH format 0, the UE transmits the PUCCH in the resource using PUCCH format 0 for HARQ-ACK information as described in clause 9.2.3.  If a UE would transmit a PUCCH format 0 with positive UEIRI and at most two HARQ-ACK information bits in a resource using PUCCH format 0, the UE transmits the PUCCH in the resource using PUCCH format 0 in PRB(s) for **positive UEIRI** as described in clause 9.2.3. The UE determines a value of and for computing a value of cyclic shift [4, TS 38.211] where is provided by *initialCyclicShift* of *PUCCH-format0*, and is determined from the value of one HARQ-ACK information bit or from the values of two HARQ-ACK information bits as in Table 9.2.5-1 and Table 9.2.5-2, respectively.  <Irrelevant part is omitted> |   Supported by: ZTE, xiaomi, Ofinno, Fujitsu, Qualcomm, NEC,  **Proposal 3.1.3 (Option-2):**  Adopt the following changes in TS38.213 Section 9.2.5.1:   |  | | --- | | 9.2.5.1 UE procedure for multiplexing HARQ-ACK or CSI and SR in a PUCCH <Irrelevant part is omitted>  If a UE would transmit a PUCCH with positive SR/UEIRI and at most two HARQ-ACK information bits in a resource using PUCCH format 0, the UE transmits the PUCCH in the resource using PUCCH format 0 in PRB(s) for HARQ-ACK information as described in clause 9.2.3. The UE determines a value of and for computing a value of cyclic shift [4, TS 38.211] where is provided by *initialCyclicShift* of *PUCCH-format0*, and is determined from the value of one HARQ-ACK information bit or from the values of two HARQ-ACK information bits as in Table 9.2.5-1 and Table 9.2.5-2, respectively.  If the UE would transmit negative SR/UEIRI and a PUCCH with at most two HARQ-ACK information bits in a resource using PUCCH format 0, the UE transmits the PUCCH in the resource using PUCCH format 0 for HARQ-ACK information as described in clause 9.2.3.  UE does not expect that SR/LRR and UEIRI using PUCCH format 0 or PUCCH format 1 are configured in a same slot where HARQ-ACK information using PUCCH format 0 or PUCCH format 1 is configured.  <Irrelevant part is omitted> |   Supported by: Huawei/HiSi’, OPPO, vivo, Lenovo, MediaTek, Spreadtrum, ETRI,  Option-3 up to UE implementation: Samsung, Ericsson, Apple, NTT DOCOMO, |
| 3.1.4 | First PUCCH for Mode-A and Mode-B ——Power control on prioritizations for transmission power reduction. | FL Note: Per companies input, the UE behaviour on prioritization for transmission power reduction on PUCCH carrying UEIRI is pending.  **Proposal 3.1.4:** Adopt the following changes in TS38.213 Section 7.5:   * **Reason for change:** When the transmission powers of multiple uplink transmissions exceed the UE’s maximum transmit power, TS 38.213 specifies a prioritization mechanism to determine which transmissions should be reduced or dropped. This prioritization covers all conventional UCI types, such as SR, CSI reports, and HARQ-ACK, ensuring consistent behavior across implementations when power reduction is needed. However, the UE-initiated CSI reporting indicator (UEIRI), introduced as a new UCI type to support UE-initiated CSI reporting, is not currently included in the priority order defined in TS 38.213. * **Summary of change:** Capture the priority rule for UEIRI, i.e., the same priority as LRR/SR. * **Consequences if not approved:** Without explicit prioritization, UE behavior may vary between implementations, potentially causing inconsistent reporting of UE-initiated CSI under power-limited conditions. This could result in the unintended suppression of UEIRI or, conversely, excessive reduction of other UCI types, impacting system performance and interoperability  |  | | --- | | 7.5 Prioritizations for transmission power reductions For single cell operation with two uplink carriers or for operation with carrier aggregation or for operation with a candidate cell configured by *LTM-Config* or for operation with a single cell configured with *sTx-2Panel*, if a total UE transmit power for PUSCH or PUCCH or PRACH or SRS transmissions on serving cell(s) or on a candidate cell, if any, in a frequency range in a respective transmission occasion would exceed , where is the linear value of in transmission occasion as defined in [8-1, TS 38.101-1] for FR1 and [8-2, TS 38.101-2] for FR2, the UE allocates power to PUSCH/PUCCH/PRACH/SRS transmissions according to the following priority order (in descending order) so that the total UE transmit power for transmissions on serving cell(s) or on a candidate cell, if any, in the frequency range is smaller than or equal to for that frequency range in every symbol of transmission occasion . If the UE transmits SRS on multiple SRS resources according to Clause 6.2.1.4 of [6, TS 38.214], the UE allocates power so that all REs of the SRS transmission have same power.  For the purpose of power allocation in this clause, if a UE is provided *uci-MuxWithDiffPrio* and the UE multiplexes HARQ-ACK information in a PUSCH, a priority index of the PUSCH is the larger of (a) the priority index of the PUSCH according to clause 9 and (b) the larger priority index of the HARQ-ACK information. When determining a total transmit power for serving cells or a candidate cell, if any, as described in Clause 21 in a frequency range in a symbol of transmission occasion , the UE does not include power for transmissions starting after the symbol of transmission occasion . The total UE transmit power in a symbol of a slot is defined as the sum of the linear values of UE transmit powers for PUSCH, PUCCH, PRACH, and SRS in the symbol of the slot.  - PRACH transmission on a candidate cell, if any, as described in Clause 21  - PRACH transmission on the PCell  - PUCCH or PUSCH transmissions with larger priority index  - For PUCCH or PUSCH transmissions with same priority index  - PUCCH transmission with HARQ-ACK information, and/or SR, and/or LRR, and/or UEIRI, or PUSCH transmission with HARQ-ACK information of the priority index  - PUCCH transmission with CSI or PUSCH transmission with CSI  - PUSCH transmission without HARQ-ACK information of the priority index or CSI and, for Type-2 random access procedure, PUSCH transmission on the PCell  - If the UE is configured with prioSCellPRACH-OverSP-PeriodicSRS-r17  - Aperiodic SRS transmission or PRACH transmission on a serving cell other than the PCell  - Semi-persistent and/or periodic SRS transmission  - otherwise,  - SRS transmission, with aperiodic SRS having higher priority than semi-persistent and/or periodic SRS, or PRACH transmission on a serving cell other than the PCell  =========unchanged omitted=========== |   Supported by: Ofinno, OPPO, vivo, Lenovo, Samsung, Fujitsu, ZTE, MediaTek, Qualcomm, Spreadtrum, CATT, NEC, Huawei, Apple, ETRI, NTT DOCOMO, |
| 3.2 | Leftover on Step-2/3 in Mode-A | FL Note: Per companies input [6], the intra-UE multiplexing/prioritization rules of PUSCH with A-CSI for PUSCH is reused for UEI-BR for Mode A. However, in the current TS38.213, the corresponding description is absent. Hence, the UE behavior is not clear when PUSCH carrying UEI-BR for Mode A overlaps with other uplink channels/RSs, and the following TP we proposed.  **Proposal 3.2:** Adopt the following changes in TS38.213 Section 9:   * **Reason for change:** Reusing the intra-UE multiplexing/prioritization rules of PUSCH with A-CSI for PUSCH for UEI-BR for Mode A was agreed. However, it is not captured in the current specification. * **Summary of change:** In TS38.213 section 9, clarify the intra-UE multiplexing/prioritization rules of PUSCH with A-CSI for PUSCH is reused for UEI-BR for Mode A. * **Consequences if not approved:** UE behavior is not clear when PUSCH carrying UEI-BR for Mode A overlaps with other uplink channels/RSs.  |  | | --- | | **9 UE procedure for reporting control information**  < Unchanged parts are omitted >  For the remaining of this clause, when a UE  - is not provided *coresetPoolIndex* or is provided *coresetPoolIndex* with a value of 0 for first CORESETs, and is provided *coresetPoolIndex* with a value of 1 for second CORESETs, on active DL BWPs of serving cells, and  - is provided *sTx-2Panel*  the UE separately determines and resolves time overlapping among first PUSCH transmissions that use respective first spatial domain filters corresponding to first *TCI-State* or *TCI-UL-State* associated with the first CORESETs, and among second PUSCH transmissions that use respective second spatial domain filters corresponding to second *TCI-State* or *TCI-UL-State* associated with the second CORESETs.  For the remaining of this clause, reference to PUSCH with semi-persistent CSI reports includes a PUSCH with UE initiated report~~s~~ when *reportTransmissionMode* is configured as ‘ModeB’ in the CSI report configuration [6, TS 38.214].  For the remaining of this clause, reference to PUSCH with aperiodic CSI reports includes a PUSCH with UE initiated report when *reportTransmissionMode* is configured as ‘ModeA’ in the CSI report configuration [6, TS 38.214].  For the remaining of this clause, for a UE operating on an NTN serving cell, the timeline conditions for resolving time overlapping between a PUSCH transmission with repetitions in an OCC group [6, TS 38.214] and PUCCH transmissions are applicable with respect to the first repetition of the PUSCH transmission in the OCC group  - if the UE would multiplex UCI from the PUCCH transmissions in the PUSCH, the UE multiplexes the UCI in all repetitions of the PUSCH transmission in the OCC group  - if the UE would not transmit a repetition of the PUSCH transmission, the UE does not transmit all repetitions of the PUSCH transmission in the OCC group  - the UE does not expect to transmit in different slots more than one PUCCHs that provide HARQ-ACK information or CSI reports and would overlap with the PUSCH transmission in the OCC group  When a UE determines overlapping for PUCCH transmissions with SL HARQ-ACK reports and PUCCH of larger and/or smaller priority index, the UE resolves the overlapping for PUCCH transmissions with SL HARQ-ACK reports and PUCCH of each priority index as described in clause 9.2.5 and 9.2.6 before resolving the overlapping for PUCCH transmissions without SL HARQ-ACK or the overlapping for PUCCH transmissions and PUSCH transmissions.  < Unchanged parts are omitted > |   Supported by: vivo, Lenovo, Ofinno, Fujitsu, MediaTek, Google, Qualcomm, Spreadtrum, Ericsson, Huawei, Apple, NTT DOCOMO, ETRI,  Not supported by: OPPO, Samsung, xiaomi, ZTE, CATT, |
| 3.3 | Details on Step-2 in Mode-B  —— Multiplexing rule. | **[120b] Agreement**  On beam report transmission procedure for UE-initiated/event-driven beam reporting, for the case the pre-configured Type-1 CG PUSCH carry the beam report, for the second UL channel in Mode-B, reuse the intra-UE multiplexing/prioritization rules of PUSCH with SP-CSI for Type-1 CG PUSCH with UEI-BR for Mode B  **FL Note:** Per companies input, unfortunately, the above agreement is not captured.  **Proposal 3.3:** Adopt the following changes in Clause 5.2.5 in TS38.214.   * **Reason for change:** Reusing the intra-UE multiplexing/prioritization rules of PUSCH with SP-CSI for PUSCH for UEI-BR for Mode B was agreed. However, it is not captured in the current specification on the priority rules of CSI reports. * **Summary of change:** In TS38.214 section 5.2.5, clarify the intra-UE multiplexing/prioritization rules of PUSCH with SP-CSI for PUSCH is reused for UEI-BR for Mode B. * **Consequences if not approved:** UE behavior is not clear when PUSCH carrying UEI-BR for Mode B overlaps with other PUSCHs.  |  | | --- | | 5.2.5 Priority rules for CSI reports  <Unchanged parts are omitted>  If a UE would transmit a first PUSCH that includes semi-persistent CSI reports or UE initiated CSI report for mode B and a second PUSCH that includes an UL-SCH on the same carrier, and the first PUSCH transmission would overlap in time with the second PUSCH transmission, the UE does not transmit the first PUSCH and transmits the second PUSCH. The UE expects that the first and second PUSCH transmissions satisfy the above timing conditions for PUSCH transmissions that overlap in time when at least one of the first or second PUSCH transmissions is in response to a DCI format detection by the UE. |   Supported by: Samsung, OPPO, vivo, Lenovo, xiaomi, Ofinno, Fujitsu, ZTE, MediaTek, Google, Qualcomm, Spreadtrum, CATT, NEC, Ericsson, Huawei, Apple, ETRI, NTT DOCOMO, |
| 3.4 | Details on  CSI reference resource | **[121] Agreement**  On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding CSI reference resource definition for a UEI beam report, the CSI reference resource for a CSI reporting is defined by a single downlink slot *,* where slot n is determined according to the uplink slot *n’* in which the second PUSCH is transmitted, and   * For mode-A, the legacy CSI reference definition of aperiodic CSI reporting is used. * For mode-B, *nCSI\_ref* is the smallest value greater than or equal to , such that slot *n*- *nCSI\_ref* corresponds to a valid downlink slot, where *Z'* corresponds to the delay requirement as defined in Clause 5.4.   In the report, a condition met indicator for new beam RS is determined according to the measurement(s) triggering the first PUCCH transmission.  Note: Strong concern was raised by vivo on the necessity of the above proposal especially considering the RAN4 status.  **FL Note:** Per companies input, regarding the companies input, the Z’ should be clarified.  **Proposal 3.4:** Adopt the following changes in Section 5.4 in TS 38.214.   * **Reason for change:** Legacy CSI reference definition of aperiodic CSI reporting is reused for mode-A and definition of Z' for mode-B follows the legacy definition, hence we should capture the agreement by declaring that and defined for legacy beam report are used for UEI-CSI report as well. * **Summary of change:** Clarifying that and defined for legacy beam report are used for UEI-CSI report as well. * **Consequences if not approved:** Z/Z' definition for UEI-CSI report is unclear.  |  | | --- | | 5.4 UE CSI computation time <Irrelevant part is omitted>  - of the table 5.4-2 if *reportQuantity* is set to 'cri-RSRP', 'ssb-Index-RSRP', 'cri-RSRP- Index' or 'ssb-Index-RSRP- Index ', is according to UE reported capability *beamReportTiming* and *KBl* is according to UE reported capability *beamSwitchTiming* as defined in [13, TS 38.306], or if the CSI report is configured with *ltm-CSI-ReportConfig* for L1-RSRP measurement, or if the CSI report is configured with *eventType*, or |   Supported by: ZTE, OPPO, vivo, Lenovo, Samsung, xiaomi, Ofinno, Fujitsu, Qualcomm, Spreadtrum, CATT, Ericsson, Huawei, Apple, NTT DOCOMO, ETRI,  Not supported by: MediaTek,  Z/Z’=0: NEC, |
| 3.5 | Details on  the counting of occupied CPU(s) | **FL Note:** Per companies input, we have the following proposals for clarifying CPU occupancy in UEIBR. Since the CPU counting has been introduced for UEIBR, then the at least one of the following should be down-selected in RAN1#122.  **Proposal 3.5:** On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding occupied CPU(s), down-select one of the following options for occupancy time of UEI beam reporting:   * + Option-1: The start of CPU occupancy time is: the first symbol of the earliest one of current beam RS and new beam RS, no later than a CSI reference resource:     - Option-1A: The end of CPU occupancy time is: the last symbol of the first PUCCH transmission occasion, regardless of whether the UEIRI is transmitted on such PUCCH transmission occasion.     - Option-1B:       * If the UEIRI is transmitted on the first PUCCH resource, the end point of CPU occupancy time is the last symbol of the scheduled or pre-configured PUSCH carrying the report.       * If the UEIRI is not transmitted on the first PUCCH resource, the end of CPU occupancy time can be the last symbol of the first PUCCH resource.     - Option-1C: The end of CPU occupancy time is: the last symbol of the second PUSCH.   + Option-2: UE periodically occupies one CSI processing unit for symbols every evaluation occasion, starting from the first symbol of the earliest one of each measurement RS resource respective latest measurement RS occasion no later than an evaluation occasion.     - FFS: The value of is subject to UE capability or specified as a certain value.     - FFS: Whether to apply different value of depending on counting evaluation within the window is enabled   + Option-3: two CPU counting is applied: * CPU counting #1: from the first symbol of the earliest one of each transmission occasions of periodic CSI-RS/SSB resource for channel measurement for L1-RSRP computation, until X symbols after the last symbol of the latest one of the CSI-RS/SSB resource for channel measurement for L1-RSRP computation in each transmission occasion,   + FFS: X, e.g., reusing * CPU counting #2:   + - Option-3A: from the first symbol after the PDCCH triggering the CSI report until the last symbol of the scheduled PUSCH carrying the report for Mode-A, or from the first symbol after the first PUCCH transmission until the last symbol of the PUSCH carrying the report for Mode-B.     - Option-3B: countering for each PUSCH occasion. Assuming the last symbol ‘L’ of PUSCH, the CPU counter #2 starts from ‘L-∆\_2’ symbol and ends at the last PUSCH symbol ‘L’.     - Opition-3C:       * In Mode A, from the first symbol after the PDCCH triggering the CSI report until the last symbol of the scheduled PUSCH carrying the report for Mode-A,       * In Mode B, from the first symbol of the earliest one of periodic CSI-RS/SSB resource for channel measurement for L1-RSRP computation, respective latest CSI-RS/CSI-IM/SSB occasion no later than the corresponding CSI reference resource, until the last symbol of the PUSCH carrying the report for Mode-B   + Option-4: Occupation time starts when the UEI beam report is configured and ends when it is released.   + Option-5: For Mode-A and Mode-B, occupation time starts from the first symbol after the first PUCCH transmission until the last symbol of the PUSCH carrying the report   + Option-6: from the first symbol after the PDCCH triggering the CSI report until the last symbol of the scheduled PUSCH carrying the report for Mode-A, or from the first symbol after the first PUCCH transmission until the last symbol of the PUSCH carrying the report for Mode-B.   Option-1: ZTE, Huawei, Nokia, NTT DOCOMO, Futurewei, Spreadtrum, ETRI,   * Option-1A: ZTE, Sharp, Transsion, * Option-1B: Huawei, Nokia, NEC, * Option-1C: NTT DOCOMO, ETRI,   Option-2: MediaTek, OPPO, Lenovo, Ericsson,  Option-3: Qualcomm, Apple, xiaomi, HONOR(?)   * Option-3A: Qualcomm, NTT DOCOMO, Apple, * Option-3B: Apple * Option-3C: MediaTek, xiaomi,   Option-4: LG, Ofinno, Spreadtrum, vivo, CATT,  Option-5: Samsung, Fujitsu,  Option-6: Fujitsu,  **Question-3.5:** Companies are encouraged to reconsider your position being based on the following agreement on candidate value of X, regarding mode-B (in short, the candidate range of ‘X’ is too wide).   * Note: If no consensus, per my assessment, we have to go with Option-4 by default.  |  | | --- | | **[121] Agreement**  On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the value of X symbols for determining available transmission occasion of the second UL channel on Mode-B   * Support Option-1 of the following as RRC candidate values for X symbols   + Option-1: 0, 1, 2, 4, 8, 16, 32, 64, 128, 256, 512   + Note: X is based on the SCS of the first PUCCH.   + Minimum value of X is subject to UE capability * Regarding ‘available’ transmission occasion of the second UL channel, the transmission restriction for of the second UL channel reuses the legacy rule of PUSCH with SP-CSI. | |
| 3.6 | Details on candidate value for UEIRI PUCCH resource periodicity | **FL Note:** Per companies’ input, explicitly supporting symbol-level periodicity of PUCCH for UEIRI was not agreed. In legacy, sub-slot based PUCCH transmission and symbol-level PUCCH periodicity are mainly intended for URLLC. For both Mode-A and Mode-B, the necessity of symbol-level periodicity for UL-SCH transmission with low latency is questionable.  **Proposal 3.6:** Adopt the following changes in Section 9.2.4A in TS 38.213.   * **Reason for change:** In legacy, sub-slot based PUCCH transmission and symbol-level PUCCH periodicity are mainly intended for URLLC. While for UEI beam reporting mode-A, the PUSCH for carrying UEI-CSI report is scheduled by a DCI after the UEIRI-PUCCH transmission. A symbol-level PUCCH periodicity does not provide benefits in reducing the report latency but instead leads to frequent uplink channel collisions. Similarly, for mode-B, the periodicity of the first PUCCH and second PUSCH is the same. Although symbol-level periodicity can be configured for Type-1 CG-PUSCH, due to the Type-1 CG-PUSCH does not carry UL-SCH, the necessity of symbol-level periodicity for UL-SCH transmission with low latency is not identified. * **Summary of change:** Remove the description of periodicity of PUCCH for UEIRI being smaller than or equal to one slot. * **Consequences if not approved:** The candidate configuration for the periodicity of UEIRI report is unclear.  |  | | --- | | 9.2.4A UE procedure for indicating UE initiated report <Irrelevant part is omitted>  The UE is provided a periodicity in symbols or slots and an offset in slots by *periodicityAndOffset* for a PUCCH transmission with UEIRI. If is larger than one slot, the UE determines a transmission occasion of a PUCCH with UEIR indication to be in a slot with number [4, TS 38.211] in a frame with number if .  ~~If is one slot, the UE expects that and every slot is a transmission occasion of a PUCCH with UEIRI.~~  ~~If is smaller than one slot, the UE determines a transmission occasion of a PUCCH with UEIRI to start in a symbol with index [4, TS 38.211] if where is the value of~~ *~~startingSymbolIndex~~*~~.~~  <Irrelevant part is omitted> |   Supported by: ZTE, NEC, OPPO, vivo, Lenovo, xiaomi, Qualcomm, Spreadtrum, CATT, NEC, Apple, ETRI, NTT DOCOMO,  Not supported by: Samsung, Ofinno, MediaTek, Huawei, |
| 3.7 | Left-over on one PUCCH associated with multi-CSI report configuration | **FL Note:** Per companies’ input [2], [8,18], regarding UE-Initiated CSI reporting for multiple CSI configurations, there is no agreement on restricting that **the CSI report configurations for UE-initiated CSI reporting associated with the same PUCCH resource must be associated with the same event type**  **Proposal 3.7:**  Adopt the following changes in TS38.214 Section 5.2.1.5.4.1d:   * Reason for change: Current specification doesn’t align with Rel-19 outcomes. There is no conclusion/agreement in Rel-19 to restrict that CSI report configurations for UE-initiated CSI reporting associated with the same PUCCH resource must be associated with the same event type. * Summary of change: The restriction that CSI report configurations for UE-initiated CSI reporting associated with the same PUCCH resource must be associated with the same event type shall be removed due to no corresponding RAN1 conclusion/agreement. * Consequences if not approved: The corresponding specification doesn’t align with the outcomes of Rel-19 feature discussion.  |  | | --- | | 5.2.1.5.4.1d UE-Initiated CSI reporting for multiple CSI configurations For a UE configured with multiple *CSI-ReportConfig* with same ~~higher layer parameters~~ *~~eventType~~* ~~and~~ *PUCCHResource*, the UE expects  - the multiple *CSI-ReportConfig* to be configured in the same CC,  - the multiple *CSI-ReportConfig* to be associated with a same CSI trigger state if *reportTransmissionMode* is configured as ‘ModeA’, else  - the same *configuredPUSCHResourceOfModeB* if *reportTransmissionMode* is configured as ‘ModeB’.  The UE reports in a single reporting instance *nrofReportedRS-UEIBR* CRIs or SSBRIs corresponding to reference signals provided by the *newBeamResourceSet* in a *CSI-ReportConfig* that satisfies the event. The CSI report includes the corresponding *CSI-ReportConfigId* and is zero padded to a fixed payload size (when needed), with the fixed payload size given by the maximum payload size among all the multiple *CSI-ReportConfig*.  <Unchanged part is omitted> |   Supported by: Huawei/HiSi, MediaTek, Fujitsu, vivo, Lenovo, xiaomi, Ofinno, Fujitsu, ZTE, Google, Qualcomm, Spreadtrum, CATT, NEC, Huawei, Apple, NTT DOCOMO, ETRI,  Not supported by: OPPO, Samsung, Panasonic, |
| 3.8 | Clarifying the field of CSI report configuration indicator | **FL Note:** Per companies’ input [6, 18], for being configured multiple UEIBR CSI reporting configuration with a single PUCCH, the codepoint of additional indication should be ordered in ascending order of corresponding CSI-ReportConfigId., rather than directly providing the corresponding CSI-reportConfigId  **Proposal 3.8:** Adopt the following changes in TS38.214 Section 5.2.1.5.4.1d:   * **Reason for change:** In TS38.214 [3], the CSI report identifier in the beam report format is captured as *CSI-ReportConfigID*. However, according to the related agreement, the CSI report identifier is determined based on the order of the triggered CSI report in the CSI report configurations associated with the same PUCCH resource. Thus, the specification description is aligned with the agreement only when all CSI report configurations in a CC are associated with the same PUCCH resource. * **Summary of change:** In TS38.214 section 5.2.1.5.4.1d, clarify the determination of a CSI report identifier in the report format when multiple CSI report configurations are associated with one PUCCH resource. * **Consequences if not approved:** The spec is not aligned with the agreement.  |  | | --- | | 5.2.1.5.4.1d UE Initiated CSI reporting for multiple CSI configurations  For a UE configured with multiple *CSI-ReportConfig* with same higher layer parameters *eventType* and *PUCCHResource*, the UE expects  - the multiple *CSI-ReportConfig* to be configured in the same CC,  - the multiple *CSI-ReportConfig* to be associated with a same CSI trigger state if *reportTransmissionMode* is configured as ‘ModeA’, else  - the same *configuredPUSCHResourceOfModeB* if *reportTransmissionMode* is configured as ‘ModeB’.  The UE reports in a single reporting instance *nrofReportedRS-UEIBR* CRIs or SSBRIs corresponding to reference signals provided by the *newBeamResourceSet* in a *CSI-ReportConfig* that satisfies the event. The CSI report includes the ~~corresponding~~ *~~CSI-ReportConfigId~~* CSI report configuration indicator as defined in Table 6.3.2.1.2-14 in [5, TS38.212] corresponding to the *CSI-ReportConfig* the and is zero padded to a fixed payload size (when needed), with the fixed payload size given by the maximum payload size among all the multiple *CSI-ReportConfig*. |   Supported by: vivo, Fujitsu, OPPO, Lenovo, xiaomi, Ofinno, Fujitsu, ZTE, MediaTek, Google, Qualcomm, Spreadtrum, CATT, NEC, Huawei, Apple, ETRI, NTT DOCOMO, |

Table 3-2 Company input for Issue 3

|  |  |
| --- | --- |
| **Company** | **Input** |
| Mod V00 | Please input your comment/preference to those proposals and questions on the issues 3.1~3.8, if needed. |
| OPPO | 3.1.1.A: Option-1  3.1.1B: Option 2  3.1.1C: Ok  3.1.2: Ok  3.1.3: Option 2 is preferred for its simplicity.  3.1.4: ok  3.2: The change seems not needed. The PUSCH for ModeA is one PUSCH with AP CSI report because it is triggered by AP trigger state in the DCI.  3.3: Ok  3.4: Ok  3.6: Ok. The symbol-level periodic PUCCH for 1st PUCCH channel of UEIBM has no use case.  3.7: do not support. The discussion was based on assumption of same even type. We did not agree different event type can be associated with same PUCCH resource.  3.8: Ok  [Mod]: Captured! |
| vivo | **Proposal 3.1.1A:** If the multiple first PUCCH resources within a slot are overlapped with PUSCH in time domain, to reflect much more information, Option-1 is preferred  **Proposal 3.1.1B:** Support Option 1  **Proposal 3.1.1C:** Ok  **Proposal 3.1.2:** Support  **Proposal 3.1.2:** Support  **Proposal 3.1.3:** Prefer Option-2  **Proposal 3.1.4:** Ok  **Proposal 3.2:** If the majority’s view is that it is unnecessary, we are fine to accept it  **Proposal 3.3:** Ok  **Proposal 3.4:** Ok  **Proposal 3.6:** Ok  **Proposal 3.7:** Ok  **Proposal 3.8:** Support  [Mod]: Captured! |
| Lenovo | **Proposal 3.1.1.A:** Support Option 2.  **Proposal 3.1.1.B:** Support Option 1.  **Proposal 3.1.1C:** Support.  **Proposal 3.1.2:** Support.  **Proposal 3.1.3:**  Option 2 is preferred for the simpler description.  **Proposal 3.1.4:** Support.  **Proposal 3.2:** Support.  **Proposal 3.3:** Support.  **Proposal 3.4:** Support.  **Proposal 3.5:** Support Option 2.  **Proposal 3.6:** Support.  **Proposal 3.7:** We are fine with this TP. We failed to see the motivation to introduce such restriction.  **Proposal 3.8:** Support.  [Mod]: Captured! |
| Samsung | **Proposal 3.1.1A**: Option 2 as a unified design when multiplexing UEI-RI with HARQ-ACK in a PUCCH. Suggest the following updates to fix the typo of Option-2   * Option-2: A field of bits of representing at most one of positive UEIRI   + The codepoints other than all-zero value in the field ~~is generated~~ are ordered based on an ascending order of the values of PUCCH resource ID associated with the first PUCCHs to represent a positive UEIBR.   + An all-zero value for the bits represents a negative UEIRI value across all  ~~LRR/SRs and/or~~ *L* UEIRIs.   [Mod]: Good catch! Done!  **Proposal 3.1.1B**: Option-1. We don’t support joint operation of CG-UCI/UTO-UCI with UEI-BR. CG-UCI/UTO-UCI is used to indicate UL-SCH information but CG PUSCH for UEI-BR does not carry UL-SCH. Suggest to remove the first sub-bullet. We think it makes sense to reuse the rules of multiplexing CG-UCI to minimize the spec impact.  [Mod]: But, the first sub-bullet is just to preclude the case that you do NOT support.    **Proposal 3.1.1C**: Prefer not to discuss in this meeting. The editors of both TS 38.212 and TS 38.213 mentioned that the solutions for multiplexing UEI-BR in a PUSCH are not clear during the CR discussion. We can focus on completing the feature and leave it to editors to capture the agreements in the CRs.  **Proposal 3.1.2**: ok  **Proposal 3.1.3**: not support. Similar case exists in legacy for multiple SRs/LRRs, we don’t have special handling. We can follow legacy to leave it to UE implementation.  **Proposal 3.1.4**: ok  **Proposal 3.2**: not support. This is non-essential correction. CSI reports include UEI-BR, no need further clarification.  **Proposal 3.3**: support  **Proposal 3.4**: ok  **Proposal 3.5**: we prefer simple solution at current stage of maintenance. Option-1 and Option-3 are way too complicated, and Optio-2 may not even work. More discussions are needed.  **Proposal 3.6**: do not support. The intention of the first PUCCH/UEIRI is to follow SR. At least for mode A, we don’t see any issues of symbol level periodicity. More importantly, the WID request to reduce latency, symbol level periodicity can be beneficial for latency reduction. Therefore, we don’t see the necessity to remove the agreed texts.  **Proposal 3.7**: do not support; similar views to OPPO.  **Proposal 3.8**: support with the following updates for clarify/accuracy  “  ~~the corresponding~~ CSI report configuration indicator as defined in Table 6.3.2.1.2-14 in [5, TS38.212] corresponding to the *CSI-ReportConfig*  ”  [Mod]: Done!  In addition to the above issues/proposals summarized by the FL, we also provided a TP in our tdoc regarding CSI report priority value in case of UEIBR for multiple CSI report configurations. The reason for our TP is that for multiple CSI report configurations, the NW does not know the associated UEI-BR is initiated by which CSI report configuration until the content of the report is decoded. However, for the handling of overlapping resources for CSI reports according to priority values, *s* should be known by NW before the report is decoded. Hence, the *s* should not be the value of CSI report configuration ID for the UEI-BR. Instead, *s* should be a fixed value which is known by NW regardless of which CSI report configuration is initiated. For example, *s* can be the minimum value of the configuration IDs of the multiple CSI report configurations – hence we provide our TP below for discussions:  [Mod]: I indeed observe this TP, but which is much relevant to the final RRC framework for UEIBR, i.e., joint coding with normal CSI-report config or a new framework structure like LTE-CSI-report config. So, let’s wait for 38.331 R19.   |  | | --- | | **38.214-j00**  5.2.5 Priority rules for CSI reports  <Unchanged parts are omitted>  CSI reports are associated with a priority value where  -  for CSI reporting with *CSI-ReportConfig* with *eventType* and with *reportTransmissionMode* set to ‘ModeA’, *y* =1 for aperiodic CSI reports to be carried on PUSCH, *y* = 2 for CSI reporting with *CSI-ReportConfig* with *eventType* and with *reportTransmissionMode* set to ‘ModeB’,*y* = 3 for semi-persistent CSI reports to be carried on PUSCH, *y* = 4 for semi-persistent CSI reports to be carried on PUCCH and *y* = 5 for periodic CSI reports to be carried on PUCCH;  -  for CSI reports carrying L1-RSRP, P-CRI, P-SSBRI, P-L1-RSRP, RS-PAI or L1-SINR and  for CSI reports not carrying L1-RSRP, P-CRI, P-SSBRI, P-L1-RSRP, RS-PAI or L1-SINR;  - *c* is the serving cell index and is the value of the higher layer parameter *maxNrofServingCells*;  - for a CSI report configured with *ltm-CSI-ReportConfig*, *c* is the serving cell index value where the report configuration is configured.  - *s* is the *reportConfigID* andis the value of the higher layer parameter *maxNrofCSI-ReportConfigurations.*  - for a CSI report configured with *ltm-CSI-ReportConfig*, *s* is the *ltm-CSI-ReportConfigId* and *Ms* is the value of the higher layer parameter *maxNrofLTM-CSI-ReportConfigurations*  - for a CSI report associated with multiple *CSI-ReportConfig* with same higher layer parameters *eventType* and *PUCCHResource*, *s* is the minimum value of the *reportConfigID*s of the multiple *CSI-ReportConfig*  <Unchanged parts are omitted> | |
| Xiaomi | Proposal 3.1.1A: Option 2 with one of positive UEIRI.  Proposal 3.1.1B: Option 2  Proposal 3.1.1C: Ok  Proposal 3.1.2: Support  Proposal 3.1.3: Option 1 is more aligned with the agreement.  Proposal 3.2: share same view as OPPO  Proposal 3.3: ok  Proposal 3.4: ok  Proposal 3.5: support Option 3C  Proposal 3.6: ok  Proposal 3.7: we are fine for different *eventtype*.  Proposal 3.8: ok  [Mod]: Captured! |
| Ofinno | **Proposal 3.1.1A:**  Support option-2, as it provides an efficient representation by compressing multiple 1-bit first PUCCHs into a ⌈log₂(L+1)⌉-bit field. This avoids excessive overhead when L increases, while still maintaining a clear mapping rule based on PUCCH resource IDs.  **Proposal 3.1.1B:**  Option-2 is aligned with the aspect of information separation. However, it is our understanding that since a 1-bit CSI part-1 format does not exist, this would in practice require introducing a new codebook. Therefore, Option-1 seems a more practical choice to us, considering that a 1-bit HARQ-ACK payload is quite natural.  **Proposal 3.1.1C:**  Support.  **Proposal 3.1.2:**  Support.  **Proposal 3.1.3 (Option-1):**  Considering we have been resolved collision cases by additional selection rules rather than by preclusion in current specification, we think option 1 is more aligned to current specification algorithm. And it may provide more flexibility to gNB’s scheduler, since there is no need to avoid collision case.  **Proposal 3.1.4:**  We support the adoption of this change, as it ensures that UEIRI is properly included in the UCI prioritization mechanism in TS 38.213, therefore avoiding inconsistent UE behavior under power-limited conditions.  **Proposal 3.2:**  We agree that a TP is needed and support the overall direction, but we think it should be approached with caution. TP is necessary because, while Mode-A of UEIBR may appear similar to legacy aperiodic CSI report, the UE ignores the *reportConfigType* which can be set to ‘aperiodic’(according to RAN2 38.331 MIMO CR), and even Mode-B of UEIBR is not transmitted periodically, so it is also aperiodic. Therefore, Mode-A should not be regarded as legacy aperiodic CSI, which justifies the need for the TP.  Reusing the intra-UE multiplexing and prioritization rules of aperiodic CSI for PUSCH for UEIBR Mode-A itself seems reasonable. However, making a general statement in TS 38.213 that “PUSCH with aperiodic CSI reports includes Mode-A” could be risky, since many detailed rules on aperiodic CSI reports exist later in the specification. A more careful step-by-step review would be better.  To do that, the related specification clauses to which it applies when this TP is adopted are captured below. Companies are encouraged to review them in detail so that consensus can be reached on accepting the proposed TP.   |  | | --- | | 9 UE procedure for reporting control information  < Unchanged parts are omitted >  A UE does not expect that a PUCCH carrying SL HARQ-ACK reports overlaps with PUSCH with aperiodic or semi-persistent CSI reports.  < Unchanged parts are omitted >  If a UE  - would multiplex UCI in a PUCCH transmission that overlaps with a PUSCH transmission, and  - the PUSCH and PUCCH transmissions fulfil the conditions in clause 9.2.5 for UCI multiplexing,  the UE  - multiplexes only HARQ-ACK information, if any, from the UCI in the PUSCH transmission and does not transmit the PUCCH if the UE multiplexes aperiodic or semi-persistent CSI reports in the PUSCH;  - multiplexes only HARQ-ACK information and CSI reports, if any, from the UCI in the PUSCH transmission and does not transmit the PUCCH if the UE does not multiplex aperiodic or semi-persistent CSI reports in the PUSCH.  < Unchanged parts are omitted >  A UE does not expect a PUCCH resource that results from multiplexing overlapped PUCCH resources, if applicable, to overlap with more than one PUSCHs if each of the more than one PUSCHs includes aperiodic CSI reports.  < Unchanged parts are omitted >  If a UE multiplexes aperiodic CSI in a PUSCH and the UE would multiplex UCI that includes HARQ-ACK information in a PUCCH that overlaps with the PUSCH and the timing conditions for overlapping PUCCHs and PUSCHs in clause 9.2.5 are fulfilled, the UE multiplexes only the HARQ-ACK information in the PUSCH and does not transmit the PUCCH.  < Unchanged parts are omitted >  The UE determines the PUSCH for UCI multiplexing by applying the following procedure on the candidate PUSCHs as described in this clause:  - If the UE is provided *sTx-2Panel*, is provided *ackNackFeedbackMode* = *separate*, and would multiplex UCI that includes HARQ-ACK information in a PUSCH, candidate PUSCHs for the UCI multiplexing are the ones associated with same *coresetPoolIndex* value as for a PUCCH transmission with the HARQ-ACK information.  - If the candidate PUSCHs that include first PUSCHs that are scheduled by DCI formats and second PUSCHs configured by respective *ConfiguredGrantConfig* or *semiPersistentOnPUSCH*, and the UE would multiplex UCI in one of the candidate PUSCHs, and the candidate PUSCHs fulfil the conditions in clause 9.2.5 for UCI multiplexing, the UE multiplexes the UCI in a PUSCH from the first PUSCHs.  - If the UE would multiplex UCI in one of the candidate PUSCHs and the UE does not multiplex aperiodic CSI in any of the candidate PUSCHs, the UE multiplexes the UCI in a PUSCH of the serving cell with the smallest *ServCellIndex* subject to the conditions in clause 9.2.5 for UCI multiplexing being fulfilled. If the UE transmits more than one PUSCHs in the slot on the serving cell with the smallest *ServCellIndex* that fulfil the conditions in clause 9.2.5 for UCI multiplexing, the UE multiplexes the UCI in the earliest PUSCH that the UE transmits in the slot. If the UE is provided *sTx-2Panel*, is provided *ackNackFeedbackMode* = *joint* or the UCI does not include HARQ-ACK information, and the UE would transmit two PUSCHs in the slot that start at a same symbol on the serving cell with smallest *ServCellIndex* and fulfil the conditions in clause 9.2.5 for UCI multiplexing, the UE multiplexes the UCI in the PUSCH from the two PUSCHs associated with CORESETs that the UE is not provided *coresetPoolIndex* or is provided *coresetPoolIndex* with a value of 0.  9.2.5 UE procedure for reporting multiple UCI types  < Unchanged parts are omitted >  If a UE would transmit multiple overlapping PUCCHs in a slot or overlapping PUCCH(s) and PUSCH(s) in a slot and, when applicable as described in clauses 9.2.5.1, 9.2.5.2, 9.2.5.3 and 18, the UE is configured to multiplex different UCI types or UCI of different priority indexes in one PUCCH, and at least one of the multiple overlapping PUCCHs or PUSCHs is in response to a DCI format detection by the UE, the UE multiplexes all corresponding UCI types or UCI of different priority indexes if the following conditions are met. If one of the PUCCH transmissions or PUSCH transmissions is in response to a DCI format detection by the UE, the UE expects that the first symbol of the earliest PUCCH or PUSCH, among a group overlapping PUCCHs and PUSCHs in the slot, satisfies the following timeline conditions  …  - if there is no aperiodic CSI report multiplexed in a PUSCH in the group of overlapping PUCCHs and PUSCHs, is not before a symbol with CP starting after after a last symbol of  - any PDCCH with the DCI format scheduling an overlapping PUSCH, and  - any PDCCH providing a DCI format with corresponding HARQ-ACK information in an overlapping PUCCH in the slot  If there is at least one PUSCH in the group of overlapping PUCCHs and PUSCHs, is given by maximum of where for the i-th PUSCH which is in the group of overlapping PUCCHs and PUSCHs, , , and are selected for the i-th PUSCH following [6, TS 38.214], is selected based on the UE PUSCH processing capability of the i-th PUSCH and SCS configuration , where  corresponds to the smallest SCS configuration among the SCS configurations used for the PDCCH scheduling the i-th PUSCH, the PDCCHs scheduling the PDSCHs, or providing the DCI formats without scheduling PDSCHs, with corresponding HARQ-ACK information on a PUCCH which is in the group of overlapping PUCCHs/PUSCHs, and all PUSCHs in the group of overlapping PUCCHs and PUSCHs.  If there is no PUSCH in the group of overlapping PUCCHs and PUSCHs, is given by maximum of where for the i-th PDSCH, or the i-th PDCCH providing a DCI format without scheduling PDSCH, with corresponding HARQ-ACK information on a PUCCH which is in the group of overlapping PUCCHs, , is selected based on the UE PUSCH processing capability of the PUCCH serving cell if configured. is selected based on the UE PUSCH processing capability 1, if PUSCH processing capability is not configured for the PUCCH serving cell. is selected based on the smallest SCS configuration between the SCS configuration used for the PDCCH scheduling the i-th PDSCH, or providing the i-th DCI format without scheduling PDSCH, with corresponding HARQ-ACK information on a PUCCH which is in the group of overlapping PUCCHs, and the SCS configuration for the PUCCH serving cell.  - if there is an aperiodic CSI report multiplexed in a PUSCH in the group of overlapping PUCCHs and PUSCHs, is not before a symbol with CP starting after after a last symbol of  - any PDCCH with the DCI format scheduling an overlapping PUSCH, and  - any PDCCH scheduling a PDSCH, or providing a DCI format , with corresponding HARQ-ACK information in an overlapping PUCCH in the slot  where corresponds to the smallest SCS configuration among the SCS configuration of the PDCCHs, the smallest SCS configuration for the group of the overlapping PUSCHs, and the smallest SCS configuration of CSI-RS associated with the DCI format scheduling the PUSCH with the multiplexed aperiodic CSI report, and for , for , and for . is defined in [6, TS 38.214] and it is applied only if of Table 5.4-1 in [6, TS 38.214] is applied to the determination of .  < Unchanged parts are omitted >  If there is one or more aperiodic CSI reports multiplexed on a PUSCH in the group of overlapping PUCCHs and PUSCHs and if symbol is before symbol that is a next uplink symbol with CP starting after after the end of the last symbol of  - the last symbol of aperiodic CSI-RS resource for channel measurements, and  - the last symbol of aperiodic CSI-IM used for interference measurements, and  - the last symbol of aperiodic NZP CSI-RS for interference measurements for a *CSI-ReportConfig*, or for all triggered sub-configurations if *CSI-ReportConfig* contains multiple sub-configurations, when aperiodic CSI-RS is used for channel measurement for triggered CSI report  the UE is not required to update the CSI report for the triggered CSI report *.* is defined in [6, TS 38.214] and corresponds to the smallest SCS configuration among the SCS configurations of the PDCCHs scheduling the PUSCHs, the smallest SCS configuration of aperiodic CSI-RSs associated with DCI formats provided by the PDCCHs triggering the aperiodic CSI reports, and the smallest SCS configuration of the overlapping PUCCHs and PUSCHs and for , for and for . |   [Mod]: Good comments!  **Proposal 3.3:**  Support.  **Proposal 3.4:**  Support.  **Proposal 3.5:**  We support Option-4. A simple and robust rule is preferable in the maintenance phase. Overestimating CPU occupancy is not a real issue, while undercounting may cause problems if the UE actually requires significant processing. Therefore, Option-4 provides a safe and practical baseline.  **Question-3.5:**  We agree with the FL’s observation, and it would be helpful if the proposal could reflect that Option-4 is adopted as the default when no consensus is reached in this meeting.  **Proposal 3.6:**  Do not support the proposal.  While we note the FL’s comment that symbol-level periodicity of PUCCH has mainly been considered for URLLC in legacy, we would like to highlight that its applicability is not necessarily limited to URLLC scenarios. In particular, for Mode-A UE-initiated reporting, symbol-level periodicity can provide benefits in terms of reducing latency and avoiding collisions when multiple uplink transmissions are multiplexed.  **Proposal 3.7:**  Support the proposal.  **Proposal 3.8:**  Support the proposal.  [Mod]: Captured! |
| Fujitsu | **Proposal 3.1.1A:** Option-2 is preferred to align with the case where L>=1 PUCCH format 0/1 with UEIRI overlap with a PUCCH format 2/3/4.  **Proposal 3.1.1B:** Option-2 is preferred.  **Proposal 3.1.1C:** OK.  **Proposal 3.1.2:** Support.  **Proposal 3.1.3:** Option-1 seems to be more aligned with the agreement.  **Proposal 3.1.4:** OK.  **Proposal 3.2:** OK.  **Proposal 3.3:** OK.  **Proposal 3.4:** OK.  **Proposal 3.5:** We are fine with Option-5 or Option-6.  **Proposal 3.7:** Support.  **Proposal 3.8:** Support.  [Mod]: Captured! |
| ZTE | **Proposal 3.1.1A: Support Option-1**  For Option-2, as mentioned by FL, only one out of multiple positive UEIRIs can be reported, which may negatively extend the latency of UEI beam report.  **Proposal 3.1.1B: Support Option-2**  For Option-1, it incurs the negative impact on the efficiency of CG-UCI and/or UTO-UCI, which can be avoided by Option-2.  **Proposal 3.1.1C: Support**  **Proposal 3.1.2: Support**  **Proposal 3.1.3: Support Option-1**  For Option-2, it deviates from the legacy design that a PUCCH resource with SR/LRR can be transmitted in the same slot where HARQ-ACK information in the resource using PUCCH format 0/1, hence we don’t see such restriction needs to be introduced in Rel-19.  **Proposal 3.1.4: Support**  **Proposal 3.2: Seems not needed**  **Proposal 3.3: Support**  **Proposal 3.4: Support**  **Proposal 3.5: Support Option-1A**  **Proposal 3.6: Support**  **Proposal 3.7: Support**  As mentioned by FL, there is no any agreements reached so far to restrict that **the CSI report configurations for UE-initiated CSI reporting associated with the same PUCCH resource must be associated with the same event type**.  **Proposal 3.8: Support**  [Mod]: Captured! |
| MediaTek | **Proposal 3.1.1A**: Prefer Option-2  Option-2 is similar to UE behavior of multiplexing UEIRI and HARQ-ACK when overlapping.  **Proposal 3.1.1B:** Fine with Option-1  We’d like to suggest a minor wording change on the Note for Option-1 that” Note: Multiplexing between first PUCCH and PUSCH is realized by replacing CG-UCI with the UEIRIs in the first PUCCH.”  [Mod]: Captured!  **Proposal 3.1.1C:** Support  **Proposal 3.1.2:** Support  **Proposal 3.1.3:** Prefer Option-2  **Proposal 3.1.4**: Support  **Proposal 3.2**: Support  We have different view from OPPO and Xiaomi that the PUSCH for Mode-A cannot be regarded as one PUSCH with AP CSI report, because spec editor has clearly differentiated a PUSCH with UE initiated reports and a PUSCH with the other CSI report in the other paragraph. Referring to the paragraph for a PUSCH for Mode-B as the following, we support this TP.   |  | | --- | | For the remaining of this clause, reference to PUSCH with semi-persistent CSI reports includes a PUSCH with UE initiated reports when *reportTransmissionMode* is configured as ‘ModeB’ in the CSI report configuration [6, TS 38.214]. |   **Proposal 3.3**: Support  **Proposal 3.4**: It seems not needed.  For UEI/ED beam reporting, the corresponding CSI reporting configuration must be configured with *eventType* **AND** *reportQuantity* is set to 'cri-RSRP', 'ssb-Index-RSRP', 'cri-RSRP- Index' or 'ssb-Index-RSRP- Index'. From our view, it has been clarified by “if *reportQuantity* is set to 'cri-RSRP', 'ssb-Index-RSRP', 'cri-RSRP- Index' or 'ssb-Index-RSRP- Index '”.  [Mod]: If my understanding is correct, from 38.214 perspective, this UEIBR behavior is marked by ‘if the CSI report is configured with *eventType*’ as clarification, similar to LTM ‘if the CSI report is configured with *ltm-CSI-ReportConfig* for L1-RSRP measurement’.  **Proposal 3.5:** Clarify our preference is Option-3 with Option-3A.  For UEI/ED beam reporting, one CPU for UE-initiated CSI reporting will be occupied when (a) UE perform L1-RSRP computation to determine event instance(s) for each evaluation occasion, and (b) UE prepares a CSI report involving L1-RSRP computing and CSI report compiling.   * + - * One CPU is occupied from the first symbol of the earliest one of each transmission occasion of periodic CSI-RS/SSB resource for L1-RSRP computation, until Z\_3^' symbols after the last symbol of the latest one of the CSI-RS/SSB resource for L1-RSRP computation in each transmission occasion.       * For a UE-initiated CSI report configured with *reportTransmissionMode* set to ‘ModeA’, one CPU is occupied from the first symbol after the PDCCH triggering the CSI report until the last symbol of the scheduled PUSCH carrying the report.       * For a UE-initiated CSI report configured with *reportTransmissionMode* set to ‘ModeB’, one CPU is occupied from the first symbol after the PUCCH carrying the UEIRI until the last symbol of the scheduled PUSCH carrying the report.   **Proposal 3.6:** Not support  There is not corresponding conclusion/agreement to precluding symbol-level PUCCH periodicity.  **Proposal 3.7:** Support  **Proposal 3.8:** Support  [Mod]: Captured! |
| Google | **Proposal 3.1.1A**: Option-1. The agreement is clear that one bit represents to one first PUCCH collided with a PUSCH. Option-2 deviates a lot from the agreement.  **Proposal 3.1.1B**: Option-1.  **Proposal 3.1.1C**: Generally fine. But it seems not an alignment TP?  **Proposal 3.1.2**: Support  **Proposal 3.2**: Generally fine. We share the same views as MTK. Besides, one PUSCH can only carry one UEI report. We thus suggest following revision. Perhaps, we should also update the wordings in above sentence for Mode B.   * For the remaining of this clause, reference to PUSCH with aperiodic CSI reports includes a PUSCH with UE initiated report~~s~~ when *reportTransmissionMode* is configured as ‘ModeA’ in the CSI report configuration [6, TS 38.214].   **Proposal 3.3**: Similar comment as Proposal 3.2. There should be one UE initiated CSI report on the first PUSCH. Suggest the following revision.   * If a UE would transmit a first PUSCH that includes semi-persistent CSI reports or UE initiated CSI report~~s~~ for mode B and a second PUSCH that includes an UL-SCH on the same carrier, …   [Mod]: Good catch! Done!  **Proposal 3.5**: We can in principle support Option-1 for starting time and Option-1A for ending time. But the definition of “the earliest one RS” is ambiguous. We should clarify it is the earliest one of current beam RS and new beam RS **after RRC configuration of the UEI report or after transmission of the PUSCH carrying UEI report or after the dropping of the PUCCH carrying UEIRI.**  **Proposal 3.7**: Support  **Proposal 3.8**: Support |
| Qualcomm | **Proposal 3.1.1A**: We support Option-1.  **Proposal 3.1.1B**: We support Option-2, which is simpler.  **Proposal 3.1.1C**: We support the proposal.  **Proposal 3.1.2**: We are okay with the proposal.  **Proposal 3.1.3**: We support Option-1.  **Proposal 3.1.4**: We support the proposal.  **Proposal 3.2**: We support the proposed TP.  **Proposal 3.3**: We support the proposal.  **Proposal 3.4**: We support the proposal.  **Proposal 3.5**: We support Option-3A.  From the perspective of the PHY layer, CSI processing involves: (1) calculating and storing CSI metrics (e.g., L1-RSRP) and (2) compiling the stored CSI metrics into a CSI report of the configured format. In the legacy CSI reporting framework, such as periodic, semi-persistent, and aperiodic CSI reporting, (1) and (2) are indistinguishable since they typically happen together. However, for UE-initiated beam reporting, (1) and (2) are decoupled, and CPU durations for (1) and (2) should be separately accounted.  For Process (1) in UE-initiated beam reporting, there is a similar process in legacy CSI reporting, i.e., Rx beam refinement procedure, and the same CPU occupancy duration can be applied, as captured in “CPU counting #1” under Option-3. For Process (2) in UE-initiated beam reporting, there is also similarity with legacy aperiodic CSI reporting, and the same CPU occupancy duration can be applied, as captured in “CPU counting #2, Option-3A” under Option-3.  For Option-3C, it is not feasible for Mode-B, especially when the CSI reference resource comes “before” the UEIRI transmission occasion. The CPU occupancy status must be synchronized between the UE and the network, and the network does not know the triggering event determination before receiving the first PUCCH. Therefore, the CPU occupancy duration for Process (2) can only start after the UEIRI transmission.  **Proposal 3.6**: We support the proposal.  **Proposal 3.7**: We support the proposal.  **Proposal 3.8**: We support the proposal.  [Mod]: Captured! |
| Spreadtrum | **Proposal 3.1.1A**: Prefer Option-1 to support multiplexing multiple UEIRIs when multiple first PUCCH resources are overlapped with a PUSCH.  **Proposal 3.1.1B**: Fine with Option-1.  **Proposal 3.1.1C**: OK  **Proposal 3.1.2**: OK  **Proposal 3.1.3:** Prefer Option-2.  **Proposal 3.1.4**: OK  **Proposal 3.2**:OK  **Proposal 3.3**: OK  **Proposal 3.4**:OK  **Proposal 3.5**: Prefer to discuss Option-1 and Option-4. Although the CPU occupancy time includes the L1-RSRP computation during periodic event evaluation and UEI beam report generation, there is no need to define multiple complex timelines for CPU occupancy.  **Proposal 3.6**: OK  **Proposal 3.7**: Support this TP. there is no agreement on restricting that the UEI CSI report configurations associated with the same PUCCH resource must be associated with the same event type. Besides, we support one CSI report associated with a single RS resource set can be configured to associate with multiple events to reduce the overhead of RS resource and configuration signaling.  **Proposal 3.8**:OK  [Mod]: Captured! |
| CATT | **Proposal 3.1.1A:** Slightly prefer Option-2 for saving bits  **Proposal 3.1.1B:** Ok to discuss, slightly prefer Option-1.  **Proposal 3.1.1C:** Support.  **Proposal 3.1.2:** Open to discuss.  **Proposal 3.1.3:** Open to discuss.  **Proposal 3.1.4:** Ok to support.  **Proposal 3.2:** Open to discuss.  **Proposal 3.3:** Ok to support.  **Proposal 3.4:** Open to discuss.  **Proposal 3.5:** Support Option-4 considering the candidate value of ‘X’ is wide enough.  **Proposal 3.6:** Open to discuss.  **Proposal 3.7:** Support.  **Proposal 3.8:** Support  [Mod]: Captured! |
| NEC | **Proposal 3.1.1A:** Option 1  **Proposal 3.1.1B:** Option 2  **Proposal 3.1.1C:** OK  **Proposal 3.1.2:** Prefer to further discuss the description after decision of **Proposal 3.1.1A.**  **Proposal 3.1.3:** Prefer Option-1  **Proposal 3.1.4:** open to discuss it  **Proposal 3.2:** need to more discussion  **Proposal 3.3:** Ok  **Proposal 3.4:** The issue should be discussed. And in our understanding, the Z/Z’ for UEI can be 0, as when UE transmits the first PUCCH, the measurement is already finished, there is no need of processing timeline. So we propose: Z/Z’ for UEI-CSI report is assumed as 0.  [Mod]: Captured, although I failed to get the point!  **Proposal 3.5:** Option 1B  **Proposal 3.6:** Support  **Proposal 3.7:** Ok  **Proposal 3.8:** Support |
| Ericsson | **Proposal 3.1.1A:** Prefer option-1. (Is there a typo in option-2? We don’t piggyback LRR/SR?)  [Mod]: Correct!  Proposal 3.1.1B: The proposal seems unclear. What does the PUSCH carry?  Proposal 3.1.1C: Isn’t this the same as P3.1.1A?  **Proposal 3.1.2: Support**  **Proposal 3.1.3:** As we understand it, this has already been discussed: it is clear that the gNB cannot distinguish between SR/LRR/UEIRI when there is a collision between 1&2 bit HARQ ACK, but it was agreed to leave this to NW implementation. The proposal to handle this was to use additional constellation points.  **Proposal 3.1.4:** It’s a small change. But we would be ok to leave this to UE implementation  **Proposal 3.2:** Support  Proposal 3.3: Support. Why was this not captured?  **Proposal 3.4: Support** |
| Panasonic | Proposal 3.7: We do not support. It is true that there was no agreement to restrict it for the same event but also there was no agreement to support for different events. So I believe this was captured correctly pending discussing this point.  [Mod]: Captured! |
| Huawei, Hisilicon | **Proposal 3.1.1A:** Prefer Option-2.  similar to what is agreed for multiplexing between first PUCCH and PUCCH format 2/3/4 carrying HARQ/CSI/SR, bits can be used to represent a positive UEIRI or negative UEIRI (when all bits are set to zero). Also, it is unlikely to have more than one positive UEIRI colliding with a PUSCH in the same slot. So, Option-1 seems an overkill.  **Proposal 3.1.1B:** Prefer Option-1. Solution-1 is functional and follows exactly the solution for UTO-UCI and has less specification impact. We don’t see a strong reason to treat UEIRI as CSI-part 1 as in Option-2.  **Proposal 3.1.1C:** Not support. To our understanding the proposal tries to address the same issue as in Proposal 3.1.1B. We think Option-1 in 3.1.1B resolves the PUCCH/PUSCH collision issue clearly.  **Proposal 3.1.2:** Support.  **Proposal 3.1.3:** We prefer Option-2 due to its simplicity. Also, Option-1 does not seem to be a complete solution as it does not address the case that more than two HARRQ-ACK information bits are to be transmitted.  **Proposal 3.1.4:** Support.  **Proposal 3.2:** OK with the clarification.  **Proposal 3.3:** OK.  **Proposal 3.4:** OK  **Proposal 3.5:** The proposal needs to be discussed and we support Option 1-B.  For both Mode A and Mode B based beam reporting, if the report notification/request is sent on the pre-configured first PUCCH resource, similar to the legacy CSI report, the end of the CPU occupancy time can be the last symbol of the scheduled or pre-configured PUSCH resource carrying the report. In turn, if the report notification/request is not sent on the pre-configured first PUCCH resource, CPU will not be occupied after the last symbol of this resource. Therefore, in this case, we think the end of CPU occupancy time can be the last symbol of the pre-configured PUCCH resource  **Proposal 3.6:** Not support.  Current spec text has no problem. We don’t see how removing sub-slot level periodicity from the spec serves any purpose.  **Proposal 3.7:** Support.  The agreement does not have such restriction. The local ID of the CSI report config is included in the report and gNB can figure out the corresponding event type from that ID. No need to restrict all CSI report configs that are associated with the same PUCCH to correspond to the same event type.  **Proposal 3.8:** Support.  [Mod]: Captured! |
| Apple | **Proposal 3.1.1A: Option.1** to prioritize the report efficiency.  Proposal 3.1.1B: Prefer Opt.1 without two sub-bullets. However, two sub-bullets are unclear for us. For example, how these two bullets are related to dynamic PUSCH e.g., as there is no CG-UCI in DG-PUSCH, what does replacing means?  [Mod]: Please review the proponent’s input. In short, it is reuse the same mechanism of multiplexing CG-UCI in PUSCH for UEIRI.  Proposal 3.1.1C: This is a special case of P3.1.1A with L = 1 and defer until concensus on P3.1.1A.  **Proposal 3.1.2: Support.**  **Proposal 3.1.3: Not support.**  We share the same view as Ericsson that this issue was extensively debated in past and was concluded online to reuse the legacy mechanism for 1-bit UEIBR/SR/LRR. It is up to NW implementation to handle this.  **Proposal 3.1.4: Ok.**  **Proposal 3.2: Ok.**  **Proposal 3.3: Support.**  **Proposal 3.4: Support.**  **Proposal 3.5: Opt.3A or Opt.3B.**  Same as in legacy, CSI processing at UE side consist of two sequential parts, one is to perform measurement and the other is to encode UCI and mulitple into PUSCH/PUCCH. The fundamental difference with legay is that in UEIBR, the UE may perform the measurement without actually reporting the results. In other words, UE still burns processing unit even without any report, which should be reflected in the CPU counting to align between gNB and UE. Therefore, Opt.4/5/6 are not feasible as UE can not hold the CSI samples and process them before the report occasion, which also violates the general rule and agreement that UE is required to measure and perform event evaluation on a per measurement occasion basis.  Regarding Opt.1 and Opt.2, it is simpler than Opt.3 but underutilize the UE’s hardware processing capability since CPU is always counted even without measurmeent occasion.  **Proposal 3.6: Support.**  **Proposal 3.7: Support.**  **Proposal 3.8: Support.** |
| Mod | Update per companies’ input |
| NTT DOCOMO | **Proposal 3.1.1A: Support Option 1.**  **Proposal 3.1.1B: Support Option 1.**  **Proposal 3.1.1C: It depends on the discussion of Proposal 3.1.1A.**  **Proposal 3.1.2: Support**  **Proposal 3.1.3:** **Share the same view as Ericsson and Apple.**  **Proposal 3.1.4: Support.**  **Proposal 3.2: Support.**  **Proposal 3.3: Support.**  **Proposal 3.4: Support.**  **Proposal 3.5.: We are fine with the proposal, and we prefer Option-3A.**  **Proposal 3.6: We are open to discuss.**  **Proposal 3.7: Support.**  Such restrictions would need a lot of PUCCH resources, and it would not be reasonable in practical.  **Proposal 3.8:** **Support.** |
| ETRI | **Proposal 3.1.1A:** Support option 1.  **Proposal 3.1.1B:** Support option 2.  **Proposal 3.1.1C:** We are okay  **Proposal 3.1.2:** Support  **Proposal 3.1.3:** Prefer option-2.  **Proposal 3.1.4:** Support  **Proposal 3.2:** Support  **Proposal 3.3:** Support  **Proposal 3.4:** Support  **Proposal 3.5:** We support Option-1 in general.  **Proposal 3.6:** Okay  **Proposal 3.7:** Support  **Proposal 3.8:** Support |
| Mod | Update per companies’ input |

## Issue 4 – Cross-CC measurement/report

|  |  |  |  |
| --- | --- | --- | --- |
| 4.1 | Clarifying the CC information for current beam | **FL Note:** Per companies’ input [6], it is to clarify that the reference signal in the indicated TCI state applied to the same CC of the reference signal configured by the *newBeamResourceSet ~~CSI-ReportConfig~~* if *CCofIndicatedTCI* is not configured. But, per my assessment on the already agreement, we did NOT try to introduce two mechanisms for deriving current-beam CC of cross-CC TCI state (i.e., only being based on *CCofIndicatedTCI* rather than either *Carrier* or *CCofIndicatedTCI*).  **Proposal 4.1:** Adopt the following changes in TS38.214 Section 5.2.1.5.4.1:   * **Reason for change:** In TS38.214 [3], the indicated TCI state is applied to the same CC of *CSI-ReportConfig,* or the CC indicated by *CCofIndicatedTCI-r19* in the *CSI-ReportConfig.* However,according to the above agreements, the CC on which the indicated TCI state is applied, and the CC in which new beam RS(s) can be the same or different. The point that needs clarification is that the CC of the *CSI-ReportConfig* may not be equal to the CC in which the new beam RS is configured, especially when the RRC parameter *carrier* is configured in the *CSI-ReportConfig*. The corresponding text proposal is provided accordingly. * **Summary of change:** In TS38.214 section 5.2.1.5.4.1, clarify the determination of CC on which the indicated TCI state is applied in the multi-CC case. * **Consequences if not approved:** Previous agreement is not captured in the specification.  |  | | --- | | 5.2.1.5.4.1a UE Initiated CSI reporting for event 2  For a UE configured with a *CSI-ReportConfig* with the higher layer parameter *eventType* set to ‘event2’, an event instance is determined for a reference signal configured by the *newBeamResourceSet* if the L1-RSRP value determined for a transmission occasion of such reference signal is an *eventThreshold* greater than the L1-RSRP value determined for a transmission occasion of  - the reference signal in the indicated TCI state (applied to the same CC of the reference signal configured by the *newBeamResourceSet ~~CSI-ReportConfig~~* if *CCofIndicatedTCI* is not configured,or to the CC indicated by *CCofIndicatedTCI* in the *CSI-ReportConfig),* if *newBeamResourceSet* is a *NZP-CSI-RS-ResourceSet* configured with *repetition*, else  - the SS/PBCH block which is QCLed with the reference signal in the indicated TCI state (applied to the same CC of the reference signal configured by the *newBeamResourceSet ~~CSI-ReportConfig~~* if *CCofIndicatedTCI* is not configured, or to the CC indicated by *CCofIndicatedTCI* in the *CSI-ReportConfig*)*,* if *newBeamResourceSet* is a *CSI-SSB-ResourceSet*.  < Unchanged parts are omitted >  5.2.1.5.4.1b UE Initiated CSI reporting for event 1  For a UE configured with a *CSI-ReportConfig* with the higher layer parameter *eventType* set to ‘event1’, an event instance is determined if the L1-RSRP value determined for a transmission occasion of  - the reference signal in the indicated TCI state (applied to the same CC of the reference signal configured by the *newBeamResourceSet ~~CSI-ReportConfig~~* if *CCofIndicatedTCI* is not configured*,* or to the CC indicated by *CCofIndicatedTCI* in the *CSI-ReportConfig*), if *newBeamResourceSet* is a *NZP-CSI-RS-ResourceSet* configured with *repetition*, else  - the SS/PBCH block which is QCLed with the reference signal in the indicated TCI state (applied to the same CC of the reference signal configured by the *newBeamResourceSet ~~CSI-ReportConfig~~* if *CCofIndicatedTCI* is not configured*,* or to the CC indicated by *CCofIndicatedTCI* in the *CSI-ReportConfig*), if *newBeamResourceSet* is a *CSI-SSB-ResourceSet*,  is lower than *eventThreshold-Event1.*  < Unchanged parts are omitted >  5.2.1.5.4.1c UE Initiated CSI reporting for event 7  For a UE configured with a *CSI-ReportConfig* with the higher layer parameter *eventType* set to ‘event7’, an event instance is determined for a reference signal configured by the *newBeamResourceSet* if the L1-RSRP value determined for a transmission occasion of such reference signal is an *eventThreshold* greater than the L1-RSRP value determined for a transmission occasion of  - the reference signal with the *valueOfQ* highest L1-RSRP out of the reference signals among the activated TCI states (applied to the same CC of the reference signal configured by the *newBeamResourceSet ~~CSI-ReportConfig~~* if *CCofIndicatedTCI* is not configured*,* or to the CC indicated by *CCofIndicatedTCI* in the *CSI-ReportConfig*), if *newBeamResourceSet* is a *NZP-CSI-RS-ResourceSet* configured with *repetition*, else  - the SS/PBCH block with the *valueOfQ* highest L1-RSRP out of the SS/PBCH block s QCLed with the reference signals among the activated TCI states (applied to the same CC of the reference signal configured by the *newBeamResourceSet ~~CSI-ReportConfig~~* if *CCofIndicatedTCI* is not configured*,* or to the CC indicated by *CCofIndicatedTCI* in the *CSI-ReportConfig*), if *newBeamResourceSet* is a *CSI-SSB-ResourceSet*.  < Unchanged parts are omitted > |   Supported by: vivo, xiaomi, Ofinno,  Not supported by: OPPO, Lenovo, Samsung, Fuijitsu, ZTE, MediaTek, Spreadtrum, CATT, NEC, Huawei, Apple, NTT DOCOMO, ETRI, |

Table 4-1 Company input for Issue 4

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| **Company** | **Input** |
| Mod V00 | Please input your comment/preference to those proposals and questions on the issues 4.1, if needed. |
| OPPO | 4.1: The changes are not correct. When CCofIndicatedTCI is not configured, the CC for determining “current TCI state and current beam” is the CC where the CSI report is configured. If it is cross-CC configuration, the CC index of the indicated TCI state shall be provided. |
| vivo | **Proposal 4.1**: In our understanding, there is no agreement about how to determine the CC on which the indicated TCI state is applied if *CCofIndicatedTCI* is absent. To clarify this ambiguity, according to the agreement achieved in RAN1#120 meeting, one potential approach is that the CC on which the indicated TCI state is applied is the same as the CC of the new beam RS. The other approach is the CC on which the indicated TCI state is applied is the CC of the CSI report configuration. If the second approach is the majority, we are fine to accept it. |
| Lenovo | **Proposal 4.1:** Do not support. Same view with FL. |
| Samsung | **Proposal 4.1**: the change is not needed. We have only agreed that the current beam RS and new beam RS should be from the same CC which is captured by the TS 38.214 already. Whether or not the indicated TCI state and the new beam RS need to be on a same CC or a different CC should not be restricted hence specified. |
| Xiaomi | Proposal 4.1: we have an agreement that the current beam RS and new beam RS should be from the same CC, but no agreement on that indicated TCI state and new beam RS should be from the same CC. |
| Ofinno | **Proposal 4.1:**  Support the proposal. |
| Fujitsu | **Proposal 4.1**: Agree with FL’s assessment. According to the agreement, the CC is only determined based on *CCofIndicatedTCI* |
| ZTE | **Proposal 4.1: Not support**  Agree with FL’s assessment. |
| MediaTek | **Proposal 4.1**: do not support  We have same understanding with OPPO. |
| Spreadtrum | **Proposal 4.1**: Agree with FL’s assessment. |
| CATT | **Proposal 4.1:** Agree with FL’s assessment. No modification is needed. |
| NEC | **Proposal 4.1**: Not needed. |
| Huawei, Hisilicon | **Proposal 4.1:** Not support.  Current text in the spec is correct. No need to force the indicated TCI state and the new beam to be on the same CC. RAN1 agreed that the new beam and current beam (and not indicated TCI state) to be on the same cell. |
| Apple | **Proposal 4.1**: Not support.  Agree with FL assement that CC for ‘indicated TCI-state’ is determined by the ‘*CCofIndicatedTCI*’ only. |
| Mod | Capture companies’ input |
| NTT DOCOMO | **Proposal 4.1**: Not support since we agree with FL’s assessment. |
| ETRI | We agree with the FL’s comment. |
| Mod | Capture companies’ input |
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1. Proposals for Monday Online Discussion

**Proposal 3.1.2:** Adopt the following changes in TS38.213 Section 9.2.5.1:

* **Reason for change:** In the last meeting, when the PUCCH resource for UE-initiated/event-driven beam reporting is collided/overlapped with a PUCCH format 2/3/4 carrying CSI/SR, the following multiplexing rule was agreed. However, in the current specification, only the priority rule of LRR, UEIRI and normal SR is captured when the PUCCH resource for UE-initiated/event-driven beam reporting is collided/overlapped with a PUCCH format 2/3/4 carrying CSI/SR.
* **Summary of change:** In TS38.213 section 9.2.5.1, add the case of no positive LRR and at least one positive UEIBRs to the multiplexing rule of PUCCH with UEIBR.
* **Consequences if not approved:** UE behavior is unclear for the case of no positive LRR and at least one positive UEIBRs, when the PUCCH resource for UE-initiated/event-driven beam reporting is collided/overlapped with a PUCCH format 2/3/4 carrying CSI/SR.

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| **9.2.5.1 UE procedure for multiplexing HARQ-ACK or CSI and SR in a PUCCH**  < Unchanged parts are omitted >  If a UE would transmit a PUCCH with HARQ-ACK information bits in a resource using PUCCH format 2 or PUCCH format 3 or PUCCH format 4 in a slot, as described in clauses 9.2.1 and 9.2.3, bits representing a negative or positive SR/UEIRI, in ascending order of the values of *schedulingRequestResourceId*,a *schedulingRequestResourceId* associated with *schedulingRequestID-BFR-SCell*, a *schedulingRequestResourceId* associated with *schedulingRequestID-BFR,* a *schedulingRequestResourceId* associated with *schedulingRequestID-BFR2* if the UEprovides *twoLRRcapability*, and a *schedulingRequestResourceId* associated with *schedulingRequestID-LBT-SCell* for SR, and then in ascending order of the values of *pucch-ResourceId* for UEIRI, are appended to the HARQ-ACK information bits and the UE transmits the combined UCI bits in a PUCCH using a resource with PUCCH format 2 or PUCCH format 3 or PUCCH format 4 that the UE determines as described in clauses 9.2.1 and 9.2.3. If one of the SRs is a positive LRR, the value of the bits indicates the positive LRR; else, if one of the UEIRIs is a positive UEIRI, the value of the bits indicates the positive UEIRI. An all-zero value for the bits represents a negative SR/UEIRI value across all SRs and UEIRIs.  If a UE would transmit a PUCCH with  CSI report bits in a resource using PUCCH format 2 or PUCCH format 3 or PUCCH format 4 in a slot, bits representing corresponding negative or positive SR/UEIRI, in ascending order of the values of *schedulingRequestResourceId*, a *schedulingRequestResourceId* associated with *schedulingRequestID-BFR-SCell*, a *schedulingRequestResourceId* associated with *schedulingRequestID-BFR,* a *schedulingRequestResourceId* associated with *schedulingRequestID-BFR2* if the UEprovides *twoLRRcapability*, and a *schedulingRequestResourceId* associated with *schedulingRequestID-LBT-SCell* for SR, and then in ascending order of the values of *pucch-ResourceId* for UEIRI, are prepended to the CSI information bits as described in clause 9.2.5.2 and the UE transmits a PUCCH with the combined UCI bits in a resource using the PUCCH format 2 or PUCCH format 3 or PUCCH format 4 for CSI reporting. If one of the SRs is a positive LRR, the value of the bits indicates the positive LRR; else, if one of the UEIRIs is a positive UEIRI, the value of the bits indicates the positive UEIRI. An all-zero value for the bits represents a negative SR/UEIRI value across all SRs and UEIRIs. |

**Supported by**: vivo, NTT DOCOMO, xiaomi, google, OPPO, Lenovo, Samsung, Ofinno, Fujitsu, ZTE, MediaTek, Qualcomm, Spreadtrum, CATT, Ericsson, Huawei, Apple, ETRI,

**Proposal 3.1.4:** Adopt the following changes in TS38.213 Section 7.5:

* **Reason for change:** When the transmission powers of multiple uplink transmissions exceed the UE’s maximum transmit power, TS 38.213 specifies a prioritization mechanism to determine which transmissions should be reduced or dropped. This prioritization covers all conventional UCI types, such as SR, CSI reports, and HARQ-ACK, ensuring consistent behavior across implementations when power reduction is needed. However, the UE-initiated CSI reporting indicator (UEIRI), introduced as a new UCI type to support UE-initiated CSI reporting, is not currently included in the priority order defined in TS 38.213.
* **Summary of change:** Capture the priority rule for UEIRI, i.e., the same priority as LRR/SR.
* **Consequences if not approved:** Without explicit prioritization, UE behavior may vary between implementations, potentially causing inconsistent reporting of UE-initiated CSI under power-limited conditions. This could result in the unintended suppression of UEIRI or, conversely, excessive reduction of other UCI types, impacting system performance and interoperability

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| 7.5 Prioritizations for transmission power reductions For single cell operation with two uplink carriers or for operation with carrier aggregation or for operation with a candidate cell configured by *LTM-Config* or for operation with a single cell configured with *sTx-2Panel*, if a total UE transmit power for PUSCH or PUCCH or PRACH or SRS transmissions on serving cell(s) or on a candidate cell, if any, in a frequency range in a respective transmission occasion would exceed , where is the linear value of in transmission occasion as defined in [8-1, TS 38.101-1] for FR1 and [8-2, TS 38.101-2] for FR2, the UE allocates power to PUSCH/PUCCH/PRACH/SRS transmissions according to the following priority order (in descending order) so that the total UE transmit power for transmissions on serving cell(s) or on a candidate cell, if any, in the frequency range is smaller than or equal to for that frequency range in every symbol of transmission occasion . If the UE transmits SRS on multiple SRS resources according to Clause 6.2.1.4 of [6, TS 38.214], the UE allocates power so that all REs of the SRS transmission have same power.  For the purpose of power allocation in this clause, if a UE is provided *uci-MuxWithDiffPrio* and the UE multiplexes HARQ-ACK information in a PUSCH, a priority index of the PUSCH is the larger of (a) the priority index of the PUSCH according to clause 9 and (b) the larger priority index of the HARQ-ACK information. When determining a total transmit power for serving cells or a candidate cell, if any, as described in Clause 21 in a frequency range in a symbol of transmission occasion , the UE does not include power for transmissions starting after the symbol of transmission occasion . The total UE transmit power in a symbol of a slot is defined as the sum of the linear values of UE transmit powers for PUSCH, PUCCH, PRACH, and SRS in the symbol of the slot.  - PRACH transmission on a candidate cell, if any, as described in Clause 21  - PRACH transmission on the PCell  - PUCCH or PUSCH transmissions with larger priority index  - For PUCCH or PUSCH transmissions with same priority index  - PUCCH transmission with HARQ-ACK information, and/or SR, and/or LRR, and/or UEIRI, or PUSCH transmission with HARQ-ACK information of the priority index  - PUCCH transmission with CSI or PUSCH transmission with CSI  - PUSCH transmission without HARQ-ACK information of the priority index or CSI and, for Type-2 random access procedure, PUSCH transmission on the PCell  - If the UE is configured with prioSCellPRACH-OverSP-PeriodicSRS-r17  - Aperiodic SRS transmission or PRACH transmission on a serving cell other than the PCell  - Semi-persistent and/or periodic SRS transmission  - otherwise,  - SRS transmission, with aperiodic SRS having higher priority than semi-persistent and/or periodic SRS, or PRACH transmission on a serving cell other than the PCell  =========unchanged omitted=========== |

**Supported by:** Ofinno, OPPO, vivo, Lenovo, Samsung, Fujitsu, ZTE, MediaTek, Qualcomm, Spreadtrum, CATT, NEC, Huawei, Apple, ETRI, NTT DOCOMO,

**Proposal 3.3:** Adopt the following changes in Clause 5.2.5 in TS38.214.

* **Reason for change:** Reusing the intra-UE multiplexing/prioritization rules of PUSCH with SP-CSI for PUSCH for UEI-BR for Mode B was agreed. However, it is not captured in the current specification on the priority rules of CSI reports.
* **Summary of change:** In TS38.214 section 5.2.5, clarify the intra-UE multiplexing/prioritization rules of PUSCH with SP-CSI for PUSCH is reused for UEI-BR for Mode B.
* **Consequences if not approved:** UE behavior is not clear when PUSCH carrying UEI-BR for Mode B overlaps with other PUSCHs.

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| 5.2.5 Priority rules for CSI reports  <Unchanged parts are omitted>  If a UE would transmit a first PUSCH that includes semi-persistent CSI reports or UE initiated CSI report for mode B and a second PUSCH that includes an UL-SCH on the same carrier, and the first PUSCH transmission would overlap in time with the second PUSCH transmission, the UE does not transmit the first PUSCH and transmits the second PUSCH. The UE expects that the first and second PUSCH transmissions satisfy the above timing conditions for PUSCH transmissions that overlap in time when at least one of the first or second PUSCH transmissions is in response to a DCI format detection by the UE. |

**Supported by:** Samsung, OPPO, vivo, Lenovo, xiaomi, Ofinno, Fujitsu, ZTE, MediaTek, Google, Qualcomm, Spreadtrum, CATT, NEC, Ericsson, Huawei, Apple, ETRI, NTT DOCOMO,

**Proposal 3.8:** Adopt the following changes in TS38.214 Section 5.2.1.5.4.1d:

* **Reason for change:** In TS38.214 [3], the CSI report identifier in the beam report format is captured as *CSI-ReportConfigID*. However, according to the related agreement, the CSI report identifier is determined based on the order of the triggered CSI report in the CSI report configurations associated with the same PUCCH resource. Thus, the specification description is aligned with the agreement only when all CSI report configurations in a CC are associated with the same PUCCH resource.
* **Summary of change:** In TS38.214 section 5.2.1.5.4.1d, clarify the determination of a CSI report identifier in the report format when multiple CSI report configurations are associated with one PUCCH resource.
* **Consequences if not approved:** The spec is not aligned with the agreement.

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| 5.2.1.5.4.1d UE Initiated CSI reporting for multiple CSI configurations  For a UE configured with multiple *CSI-ReportConfig* with same higher layer parameters *eventType* and *PUCCHResource*, the UE expects  - the multiple *CSI-ReportConfig* to be configured in the same CC,  - the multiple *CSI-ReportConfig* to be associated with a same CSI trigger state if *reportTransmissionMode* is configured as ‘ModeA’, else  - the same *configuredPUSCHResourceOfModeB* if *reportTransmissionMode* is configured as ‘ModeB’.  The UE reports in a single reporting instance *nrofReportedRS-UEIBR* CRIs or SSBRIs corresponding to reference signals provided by the *newBeamResourceSet* in a *CSI-ReportConfig* that satisfies the event. The CSI report includes the ~~corresponding~~ *~~CSI-ReportConfigId~~* CSI report configuration indicator as defined in Table 6.3.2.1.2-14 in [5, TS38.212] corresponding to the *CSI-ReportConfig* the and is zero padded to a fixed payload size (when needed), with the fixed payload size given by the maximum payload size among all the multiple *CSI-ReportConfig*. |

**Supported by:** vivo, Fujitsu, OPPO, Lenovo, xiaomi, Ofinno, Fujitsu, ZTE, MediaTek, Google, Qualcomm, Spreadtrum, CATT, NEC, Huawei, Apple, ETRI, NTT DOCOMO,

**Proposal 3.4:** Adopt the following changes in Section 5.4 in TS 38.214.

* **Reason for change:** Legacy CSI reference definition of aperiodic CSI reporting is reused for mode-A and definition of Z' for mode-B follows the legacy definition, hence we should capture the agreement by declaring that and defined for legacy beam report are used for UEI-CSI report as well.
* **Summary of change:** Clarifying that and defined for legacy beam report are used for UEI-CSI report as well.
* **Consequences if not approved:** Z/Z' definition for UEI-CSI report is unclear.

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| 5.4 UE CSI computation time <Irrelevant part is omitted>  - of the table 5.4-2 if *reportQuantity* is set to 'cri-RSRP', 'ssb-Index-RSRP', 'cri-RSRP- Index' or 'ssb-Index-RSRP- Index ', is according to UE reported capability *beamReportTiming* and *KBl* is according to UE reported capability *beamSwitchTiming* as defined in [13, TS 38.306], or if the CSI report is configured with *ltm-CSI-ReportConfig* for L1-RSRP measurement, or if the CSI report is configured with *eventType*, or |

**Supported by:** ZTE, OPPO, vivo, Lenovo, Samsung, xiaomi, Ofinno, Fujitsu, Qualcomm, Spreadtrum, CATT, Ericsson, Huawei, Apple, NTT DOCOMO, ETRI,

**Not supported by:** MediaTek,

**Z/Z’=0:** NEC,

**Proposal 1.2:** Adopt the following changes in TS38.213 Section 5.2.1.5.4.1:

* **Reason for change:** Besides for correcting typos, when “current” beam RS for event evaluation is SSB QCLed with RS in an activated TCI state, two interpretations of the current beam RS having “the Q-th best quality” are possible:
  + Interpretation-1: the SSB having the Q-th best quality among all SSBs QCLed with the RSs in all the activated TCI states
  + Interpretation-2: the SSB QCLed with the RS having the Q-th best quality among all RSs in all the activated TCI states
* **Summary of change:** 
  + In TS38.214 section 5.2.1.5.4.1, add “state” after “indicated TCI”.
  + In TS38.214 section 5.2.1.5.4.1b, revise “L1-RSRPs” to “L1-RSRP”.
  + In TS38.214 section 5.2.1.5.4.1c, clarify the current beam RS determination when *enabledCurrentBeamReport* is configured for event-7, i.e., capturing the interpretation-1.
* **Consequences if not approved:** It can cause inconsistency in the specification description.

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| 5.2.1.5.4.1 UE Initiated CSI reporting  For a UE configured with a *CSI-ReportConfig* with *eventType* for periodic reference signals with the same periodicity configured by the *newBeamResourceSet*, without *eventDetectionTimeWindowLength,* and with *dl-OrJointTCI-StateList*, when an event instance is determined (as described in the following clauses),  - for a reference signal configured by the *newBeamResourceSet*, if *eventType* is set to ‘event2’ or ‘event7’, or  - for the reference signal in the indicated TCI state or the SS/PBCH block which is QCLed with the reference signal in the indicated TCI state, if *eventType* is set to ‘event1’,  the UE transmits UEIRI on a PUCCH format 0 or format 1 in the PUCCH resource (in the CC provided by *pucchCell,* if configured, in the *CSI-ReportConfig*) configured by *PUCCHResource* in the *CSI-ReportConfig*.  For a UE configured with a *CSI-ReportConfig* with *eventType* for periodic reference signals with the same periodicity configured by the *newBeamResourceSet*, with *eventDetectionTimeWindowLength*, and with *dl-OrJointTCI-StateList,* when an event instance is determined (as described in the following clauses),  - for a reference signal configured by the *newBeamResourceSet*, if *eventType* is set to ‘event2’ or ‘event7’, or  - for the reference signal in the indicated TCI state or the SS/PBCH block which is QCLed with the reference signal in the indicated TCI state, if *eventType* is set to ‘event1’,  the UE  - starts a timer for such reference signal from the initial value equal to the time window length provided by *eventDetectionTimeWindowLength* and sets the counter to 1,if the timer for such reference signal is not running; or  - increments the counter for such reference signal by 1, if the timer for such reference signal is running.  < Unchanged parts are omitted >  5.2.1.5.4.1c UE Initiated CSI reporting for event 7  < Unchanged parts are omitted >  After transmitting UEIRI, the UE reports, as defined in Clause 6.3.2.1.2 of [5, TS 38.212] in a single reporting instance *nrofReportedRS-UEIBR* CRIs or SSBRIs corresponding to reference signals provided by the *newBeamResourceSet* that comprise at least one reference signal that triggers the UEIRI transmission. For each CRI or SSBRI, the CSI report includes the absolute L1-RSRP or differential L1-RSRP and, when *PresenceOfConditionMetIndicator* is configured a condition met indicator indicating whether the reference signal indicated by reported CRI or SSBRI triggers the UEIRI transmission and, when *enabledCurrentBeamReport* is configured, the differential L1-RSRP corresponding to the reference signal with the *valueOfQ*-th highest L1-RSRP out of the activated TCI state reference signals, or to the SS/PBCH block with the *valueOfQ*-th highest L1-RSRP out of the SS/PBCH blocks QCLed with the activated TCI state reference signals ~~which is QCLed with the reference signal with the~~ *~~valueOfQ~~* ~~highest L1-RSRP out of the activated TCI state reference signals~~. The UE sends the CSI report  - on a PUSCH indicated by the DCI format 0\_1/0\_2 in a PDCCH reception if *reportTransmissionMode* is configured as ‘ModeA’ and the CSI trigger state associated with the *CSI-ReportConfig* is indicated in the CSI request field in the DCI format 0\_1/0\_2, or  - on a type 1 CG-PUSCH configured by *configuredPUSCHResourceOfModeB* in the same CC as the corresponding *CSI-ReportConfig*, on the first available transmission occasion *numOfSymbols-ModeB* symbols after the end of the transmitted PUCCH if *reportTransmissionMode* is configured as ‘ModeB’, where the periodicity of the PUCCH resource and type 1 CG-PUSCH resource is the same, *numOfSymbols-ModeB* is based on the numerology of the PUCCH resource with UEIRI transmitted, and the CG-PUSCH does not carry UL-SCH.  < Unchanged parts are omitted > |

**Supported by:** vivo, Samsung, OPPO, xiaomi, Lenovo, Ofinno, Fujitsu, ZTE, MediaTek, Google, NEC, Ericsson, Apple, NTT DOCOMO, ETRI,

**Not supported by:** Huawei,

**Proposal 1.4 (R1-2505533):**

Update the RRC candidate values for a threshold value eventThreshold-Event1-r19 for trigger event detection regarding Event-1.

* only values **16**, …,113 in RSRP-Range are valid.

**Supported by:** Samsung, vivo, Ofinno, ZTE, MediaTek, Google, Spreadtrum, CATT, NEC, Ericsson, Apple, NTT DOCOMO, ETRI,

Not supported by: OPPO, Lenovo, Huawei,

**Proposal 1.1:** Regarding triggering event determination, besides for Candidate#2, at least Candidate #1, Candidate#3, Candidate#5 and Candidate#7 are additionally supported for resetting the counting and stopping the timer.

* Candidate#1: RS reconfiguration for new beam is received;
  + In such case, the UE only needs to reset the counting of [the newly-reconfigured new beams/all new beams], and stops the timers for those new beams.
* ~~Candidate#3: UEI beam report is transmitted.~~
  + ~~In such case, the UE only resets the counting of [new beams fulfilling triggering condition and reported by the UEI beam report/all new beams], and stops the timers for those new beams.~~
* Candidate#5: The timer expires.
  + In such case, the UE only needs to reset the counting for the new beam corresponding to the timer.
* Candidate#7: The RRC parameter(s) of the threshold for event evaluation in Event-1/2 value of Q in Event-7, *eventInstanceCount* and *eventDetectionTimeWindowLength* are reconfigured for the CSI report configuration for UEI beam report.
  + In such case, the UE need to reset the counting and stop the timers for all new beams.

When Candidate#2 is satisfied, the timers for all new beams should be stopped, besides for resetting counting.

Note: Candidate#2: The measured current beam RS is updated based on indicated TCI state

**Supported by:** Apple, Ericsson, Huawei/HiSi, ZTE, NTT DOCOMO, Spreadtrum (at least #1), UNISOC, xiaomi, ofinno, Fujitsu, google, vivo, Lenovo, Samsung(?), CATT(#1,5,7), NEC, ETRI,

**Not support Candidate#1:** OPPO,

**Not support Candidate#3:** Qualcomm, Panasonic, NTT DOCOMO, CATT

**Not support Candidate#5:** OPPO, Qualcomm,

**Not support Candidate#7:**

**Proposal 3.1.1A:** On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the multiplexing a number of L (L>=1) first PUCCH(s) with UEIRIs collided/overlapped with a PUSCH, down select one of the following options:

* Option-1: A field of bit sequence with a length of L bit is piggyback into the PUSCH.
  + Each of bits in the bit sequence corresponds to respective first PUCCH(s) by an ascending order of the values of PUCCH resource ID associated with the first PUCCHs.
* Option-2: A field of bits of representing at most one of positive UEIRI
  + The codepoints other than all-zero value in the field are ordered based on an ascending order of the values of PUCCH resource ID associated with the first PUCCHs to represent a positive UEIBR.
  + An all-zero value for the bits represents a UEIRI value across all *L* UEIRIs.

**Option-1:** ZTE, OPPO, vivo, Google, Qualcomm, Spreadtrum, NEC, Ericsson, Apple, NTT DOCOMO, ETRI,

**Option-2:** Huawei/Hisi’, Lenovo, Samsung, xiaomi, Ofinno, Fujitsu, MediaTek, CATT,

1. Previous agreements
   1. RAN1#121

**[121] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the multiplexing a number of L (L>=1) PUCCH format 0/1 with UEIRIs are collided/overlapped with a PUCCH format 2/3/4 carrying **HARQ/CSI**, reuse the legacy SR multiplexing rule.

* The value of bits is based on an ascending order of the values of PUCCH resource ID associated with the first PUCCHs.

**[121] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the multiplexing a number of L (L>=1) first PUCCH is collided/overlapped with a PUCCH format 2/3/4 carrying HARQ/CSI/SR.

* Option-1: Extend the SR field of bits to a field of bits of representing at most one of positive SR or positive UEIRI
  + The value in the field is based the ascending order of SR ID first and then the ascending order of the PUCCH resource ID associated with the first PUCCHs.
  + If one of the SRs is a positive LRR, the value of the bits indicates the positive LRR, else, if one of the UEIBRs is a positive UEIBR, the value of the bits indicates the positive UEIBR.
  + An all-zero value for the bits represents a negative SR and UEIRI value across all LRR/SRs and/or *L* UEIRIs.

**[121] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding occupied CPU(s), OCPU = 1 is occupied for a CSI report configuration.

* Note: That is the same number of occupied CPU for legacy L1-RSRP measurement.

**[121] Agreement**

Regarding triggering event determination, on candidate values of supported RRC parameters,

* Support the following as RRC candidate values for a threshold value *eventThreshold-r19* for trigger event detection regarding Event-2 or Event-7.
  + Option-2: 0, 1, …, 30, 31 dB
* Support the following as RRC candidate values for a threshold value *eventThreshold-Event1-r19* for trigger event detection regarding Event-1.
  + Reusing *RSRP-Range* in RRC
    - Note: only values 14, …,113 in *RSRP-Range* are valid
* Support the following as RRC candidate values for the time window length for triggering event determination *eventDetectionTimeWindowLength-r19*
  + 4, 5, 8, 10, 16, 20, 40, 80, 160, 320, 640, 1280 ms
* Support the following as RRC candidate values for the counting threshold *eventInstanceCount-r19*
  + Option-1: 2, …, 16

**[121] Agreement**

On cross-CC beam report measurement for UE-initiated/event-driven beam reporting, regarding Event-2, introduce an RRC parameter to indicate one from {SpCell, PUCCH-Scell} as the cell of the configured PUCCH.

* Note: It is up to NW implementation to configure same or different PUCCH resource IDs in different serving cells

**[121] Agreement**

On cross-CC beam report measurement for UE-initiated/event-driven beam reporting, regarding the evaluation periodicity for determining event instance, the periodicity of the current beam RS should be the same as that of the new beam RS(s).

* The evaluation periodicity is the same as the periodicity of the current and new beam RS(s).

Above applies for all events.

**[121] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the value of X symbols for determining available transmission occasion of the second UL channel on Mode-B

* Support Option-1 of the following as RRC candidate values for X symbols
  + Option-1: 0, 1, 2, 4, 8, 16, 32, 64, 128, 256, 512
  + Note: X is based on the SCS of the first PUCCH.
  + Minimum value of X is subject to UE capability
* Regarding ‘available’ transmission occasion of the second UL channel, the transmission restriction for of the second UL channel reuses the legacy rule of PUSCH with SP-CSI.

**[121] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the multiplexing/dropping rule(s) of 1-bit first PUCCH, support **Option-3** of the following rules for the Case-2: the 1-bit first PUCCH is collided/overlapped with a PUSCH

* Option-3: Piggyback 1-bit indication of first PUCCH into the PUSCH.
  + The 1-bit indication is always multiplexed in the PUSCH, regardless that UEI beam report procedure is triggered.

**[121] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding CSI reference resource definition for a UEI beam report, the CSI reference resource for a CSI reporting is defined by a single downlink slot *,* where slot n is determined according to the uplink slot *n’* in which the second PUSCH is transmitted, and

* For mode-A, the legacy CSI reference definition of aperiodic CSI reporting is used.
* For mode-B, *nCSI\_ref* is the smallest value greater than or equal to , such that slot *n*- *nCSI\_ref* corresponds to a valid downlink slot, where *Z'* corresponds to the delay requirement as defined in Clause 5.4.

In the report, a condition met indicator for new beam RS is determined according to the measurement(s) triggering the first PUCCH transmission.

Note: Strong concern was raised by vivo on the necessity of the above proposal especially considering the RAN4 status.

**[121] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding Event-1 and Event-7, one PUCCH resource of first PUCCH can be associated with one or multiple CSI report configurations.

**[121] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding priority rules for CSI report multiplexing/dropping, UEI beam report for both mode-A and mode-B is prioritized over Semi-persistent CSI reports on PUCCH and Periodic CSI reports on PUCCH

* UEI beam report for mode-A > Aperiodic CSI report > UEI beam report (for mode-B) > Semi-persistent CSI reports on PUSCH

Note-1: The intra-UE multiplexing/prioritization rules of PUSCH with A-CSI for PUSCH is reused for UEI-BR for Mode A.

Note-2: How to capture the above is up to Editor.

* 1. RAN1#120-bis

**[120b] Agreement**

On cross-CC beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding Event-2, the following working assumption is confirmed with the following modification.

* The first PUCCH and the second PUSCH associated for UE-initiated/event-driven beam reporting are from different PUCCH groups
  + Subject to separate UE capability
* Note: From RAN1 perspective, the above does NOT introduce any spec impact except for UE capability signaling

**[120b] Agreement**

Regarding triggering event determination for Event 2, on resetting the counting, the following modification on the agreed Candidate #2 in RAN1#120 is supported.

* Candidate#2: ~~[~~The measured current beam RS is updated based on~~]~~ indicated TCI state ~~is updated~~;
  + In such case, the UE needs to reset the counting for all new beams.
  + FFS: Further details on the update (if necessary)

**[120b] Agreement**

On UE-initiated/event-driven beam reporting, support the following interpretation on each of the codepoints of the ‘1-bit’ condition met indicator as follows:

* ‘0’ – indicating that the Event-2 instances for corresponding CRI/SSBRI within the time window doesn’t reach the configured number M.
* ‘1’ – indicating that the Event-2 instances for corresponding CRI/SSBRI within the time window reach the configured number M.

FFS: whether/how to introduce the ‘1-bit’ condition met indicator for Event 7.

**[120b] Agreement**

On cross-CC beam report measurement for UE-initiated/event-driven beam reporting, regarding Event-2, introduce an RRC parameter to indicate *ServCellIndex* on which the indicated TCI state used to determine the current beam RS is applied

* FFS: Indication of the cell that corresponds to the configured first PUCCH resource in CSI report config including whether it is necessary

**[120b] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, for the case the pre-configured Type-1 CG PUSCH carry the beam report, for the second UL channel in Mode-B, reuse the intra-UE multiplexing/prioritization rules of PUSCH with SP-CSI for Type-1 CG PUSCH with UEI-BR for Mode B

**[120b] Agreement**

Regarding triggering event determination for Event 2, on the measurement window for initiating the UE-initiated/event-driven beam reporting procedure, down-select **one** of the following options in RAN1#120bis.

* Option-1: The measurement window is from T\_PUCCH – T\_proc – T\_window to T\_PUCCH – T\_proc, where T\_PUCCH is a transmission occasion of a first PUCCH, and T\_proc is RRC configured.
* Option-3: The length, slot offset and periodicity of a measurement window are configured per CSI report configuration by NW.
* Option-4: If an Event-2 instance for a new beam is obtained at the time [and the time for the new beam is not running], UE (re)starts the timer for the new beam, where the expiry time of the timer is equal to the NW-configured length of the time window (T\_window)
* Note: T\_window is the agreed time window parameter for measurement.

**[120b] Agreement**

On UE-initiated/event-driven beam reporting, support the following for Event 1

* Regarding report format of L1-RSRP value of current beam,
  + Option-A2: L1-RSRP of current beam is absolute L1-RSRP (7-bit quantized, rather than 4-bit as in Event-2).

**[120b] Agreement**

On UE-initiated/event-driven beam reporting, regarding current beam report on Event 1, reuse RRC parameter *enabledCurrentBeamReport-r19* to enable/disable the RSRP report of current beam.

**[120b] Conclusion**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the case that one PUCCH resource of first PUCCH can be associated with one or multiple CSI report configurations, there is NO RAN1 consensus on supporting multiple UEI beam reports carrying in a second PUSCH.

**[120b] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the multiplexing/dropping rule(s) of 1-bit first PUCCH, support the following rule for the Case-4: the 1-bit first PUCCH is collided/overlapped with a PUCCH format 0/1 carrying HARQ.

* Option-1: Follow legacy SR multiplexing rule.
  + Note: There is no further enhancement on additional phase offset/constellation point(s).

**[120b] Conclusion**

Regarding resource mapping/configuration between first and second UL channel associated with a same CSI report configuration in Mode-B, there is NO consensus on further supporting the case that first PUCCH resource and pre-configured resource for second UL channel can have different periodicities (in ms).

**[120b] Agreement**

Regarding triggering event determination for Event 2, on the measurement window for initiating the UE-initiated/event-driven beam reporting procedure, support Option-4.

* Option-4: If an Event-2 instance for a new beam is obtained at the time and the timer for the new beam is not running, UE starts the timer for the new beam, where the expiry time of the timer is equal to the NW-configured length of the time window (T\_window)
  + Note: Timer is new beam specific.
* Note: T\_window is the agreed time window parameter for measurement.
* Introduce separate UE capability to limit the number of timers. There is only 1 timer per new beam.

Above agreement is captured in RAN1 specifications.

**[120b] Agreement**

On UE-initiated/event-driven beam reporting, the procedure of triggering event determination is captured in RAN1 spec.

**[120b] Conclusion**

There is no RAN1 consensus on the following proposal:

*On UE-initiated/event-driven beam reporting, support at least Option-1 of following for Event 7 as an extension on report format for Event-2*

* *Option-1: Additional field to indicate the codepoint of the activated TCI state with Q-th best quality.*
  + *FFS: Further report codepoints of other activated TCI state(s) [, e.g., from {Q+1}-th best quality to the worst one];*
  + *FFS: Details of the additional indication.*
* *Option-2: Extending the maximum number of reported RS(s) to 8.*
  + *[Note: If Option 2 is agreed, RAN1 can revisit the agreed maximum value of N for event-2.]*
* *Above is applicable only if time window and a configurable value M for event counting on Event-7 are not configured.*

**[120b] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting for a CSI report configuration, down-select at least one of the following candidates in RAN1#121:

* Candidate#1: To introduce a prohibit timer for mode-A and/or mode-B
  + Option-1A: In the case that triggering-event associated with the CSI report configuration is determined [by the same triggering beams(s) as the last transmitted PUCCH], if the prohibit timer is NOT running, the UE can transmit first PUCCH;
    - At the first symbol after the end of the PUSCH transmission, the UE starts the prohibit timer
  + Option-1B: In the case that triggering-event associated with the CSI report configuration is determined, if the prohibit timer is NOT running, the UE can transmit first PUCCH;
    - At the first symbol after the end of the first PUCCH transmission, the UE starts the prohibit timer
  + If the prohibit timer is running, the first PUCCH is not allowed to be transmitted.
* Candidate#2: To introduce a time interval for mode-A and/or mode-B
  + Option-2A: For a first PUCCH transmission occasion, if there is a transmission of another second PUSCH [corresponding to the CSI report determined by the same triggering beam(s) as the first PUCCH] within a configurable time interval before the first PUCCH transmission occasion, the UE should not transmit the first PUCCH.
  + Option-2B: For a first PUCCH transmission occasion, if there is a transmission of another first PUCCH(s) within a configurable time interval before the first PUCCH transmission occasion, the UE should not transmit the first PUCCH.
* Candidate#3: No further enhancement.

**[120b] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the multiplexing/dropping rule(s) of 1-bit first PUCCH, down-select one of the following rules for the Case-2: the 1-bit first PUCCH is collided/overlapped with a PUSCH, in RAN1#121

* Option-1: Prioritize first PUCCH over PUSCH, i.e., PUSCH is dropped.
  + FFS: If the PUSCH should be with UL-SCH or not for UEI beam report
* Option-3: Piggyback 1-bit indication of first PUCCH into the PUSCH.
  + FFS: The 1-bit indication is always multiplexed in the PUSCH, regardless that UEI beam report procedure is triggered.
  + FFS: If the PUSCH should be with UL-SCH or not for UEI beam report
* Option-4: Reuse the SR dropping rules.
* FFS: whether/how to handle the case of different PHY priorities.

**Conclusion**

There is no RAN1 concensus on the following. No spec change needed.

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the multiplexing/dropping rule(s) of 1-bit first PUCCH, support one of the following rule for the Case-3: the 1-bit first PUCCHs corresponding to different CSI configuration for UE-initiated/event-driven beam reporting are overlapping in the time domain

* Option-1: Per CSI report configuration.
* Option-2: Up to implementation.
* Option-3: UE transmits the first PUCCH with higher priority (e.g., PUCCH resource with lower PUCCH resource ID, or event-type)
* Option-4: Multiplexing all 1-bit indications

**[120b] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, confirming the following working assumption with the following modification.

* For Mode-A, the multiple CSI report configurations associated with the same PUCCH resource should be associated with a same *CSI-AperiodicTriggerState*.
* FFS: For Mode-A, the multiple CSI report configurations associated with the same *CSI-AperiodicTriggerState* should be associated with a same PUCCH resource.

**[120b] Conclusion**

There is no RAN1 concensus on the following. No spec change needed.

For event 2, when one PUCCH resource of first PUCCH can be associated with one or multiple CSI report configurations, and if multiple UE initiated beam report procedures occur, down-select one of the following options:

* Option-1: It is up to UE implementation to select one of configuration.
* Option-2: The UEI beam report with highest priority is reported
  + FFS: priority, e.g., lowest *CSI-ReportConfigId*, event-type or based on legacy CSI report priority rule
* Option-3: The report triggered in the latest measurement is reported in PUSCH
  1. RAN1#120

**[120] Agreement**

On cross-CC beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding Event-2, the following working assumption is confirmed with the following modification.

* The first PUCCH and the second PUSCH associated for UE-initiated/event-driven beam reporting are from different PUCCH groups
  + Subject to separate UE capability
* Note: From RAN1 perspective, the above does NOT introduce any spec impact except for UE capability signaling

**[120] Agreement**

On cross-CC beam report measurement for UE-initiated/event-driven beam reporting, regarding Event-2, the following is supported

* The current beam RS and new beam RS(s) are in the same CC
  + The above does NOT imply to preclude the cross-CC TCI indication.
* The CC on which the indicated TCI state is applied, and the CC in which new beam RS(s) are can be the same or different.
  + FFS: Whether/how to introduce an RRC parameter to indicate the CC on which the indicated TCI state is applied.

**[120] Agreement**

On UE-initiated/event-driven beam reporting, for Event 7, the candidate value of RRC parameter *Q* = {1, 2, 3, 4, 5, 6, 7, 8}

* Note: The UE does not expect that the configured Q is greater than the number of the activated DL/joint TCI state(s).

**[120] Conclusion**

There is no RAN1 consensus on the following proposal:

* On beam report transmission procedure for UE-initiated/event-driven beam reporting, multi-bit indication in the first PUCCH is supported.

**[120] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding Mode-B, the value of X symbols for determining available transmission occasion of the second UL channel is configured by RRC (FFS: subject to a corresponding UE capability)

**[120] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, support the following option of dropping rule for the Case-1: the 1-bit first PUCCH is collided/overlapped with a PUCCH carrying normal SR and/or a PUCCH with normal LRR

* Option-1: LRR > first PUCCH > normal SR

Note: When the 1-bit first PUCCH is collided/overlapped with a PUCCH carrying normal SR and/or a PUCCH with normal LRR, only one of them is transmitted based on the above priority rule

**[120] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the triggering procedure in Step-2 of Mode-A, the following Option-1 is supported.

* Option-1: A CSI trigger state corresponding to UE-initiated/event-driven beam reporting can NOT be associated with legacy AP-CSI report configuration.

**[120] Agreement**

Regarding triggering event determination for Event 2, at least Candidate #2 is supported for resetting the counting.

* Candidate#1: RS reconfiguration/update or MAC-CE signaling (if supported) for new beam is received;
  + FFS: whether to reset the counting for all new beams.
  + FFS: whether to maintain the counting whose new beam is NOT updated.
* Candidate#2: [The measured current beam based on] indicated TCI state is updated;
  + In such case, the UE need to reset the counting for all new beams.
* Candidate#3: UEI beam report is transmitted;
  + FFS: Only reset the counting of new beams fulfilling triggering condition and reported by the UEI beam report
* Candidate#4: NW response (e.g., DCI in step-2 of Mode-A) is detected.
* Candidate#5: The time window expires
* Candidate#6: The threshold for event evaluation is re-configured by RRC signaling
* (FFS) Candidate#7: The RRC parameter(s) associated with the CSI report configuration for UEI beam report is reconfigured.
  + FFS: RRC parameter(s)
* FFS: Other candidates

Note: Whether this proposal is captured in RAN1 or RAN2 is a separate discussion point.

**[120] Agreement**

On UE-initiated/event-driven beam reporting, for Event 1, support **Option-2** for RS measurement:

* Option-2: RS resource set for new beam is configured in the CSI reporting configuration, and the following implicit manner for enabling one of either scheme-1 or scheme-2 is used:
  + If the RS(s) for new beam are CSI-RS configured in a CSI-RS resource set configured with *repetition*, Scheme-1 is enabled; otherwise, Scheme-2 is enabled.
  + In such case, the report format for Event-2 is reused unless critical technical issue is identified
    - FFS: How to report the RSRP value of the current beam
    - FFS: RSRP of the current beam is always reported

**[120] Agreement**

Regarding triggering event determination for Event 2, on the measurement window for initiating the UE-initiated/event-driven beam reporting procedure, further study the following options for possible down-selection

* Option-1: The measurement window is from T\_PUCCH – T\_proc – T\_window to T\_PUCCH – T\_proc, where T\_PUCCH is a transmission occasion of a first PUCCH, and T\_proc is RRC configured.
* Option-2: The measurement window is from T\_Instance – T\_window to T\_Instance, where T\_Instance is an evaluation occasion of event instance, and T\_proc is RRC configured.
  + The UEI beam report in the second PUSCH is based on the most recent measurement for new/current beam RS(s).
* Option-3: The length, slot offset and periodicity of a measurement window are configured per CSI report configuration by NW.
* Option-4: If an Event-2 instance for a new beam is obtained at the time , UE (re)starts the timer for the new beam, where the expiry time of the timer is equal to the NW-configured length of the time window (T\_window)
* Note: T\_window is the agreed time window parameter for measurement.
* Note: Other options are not precluded.

**[120] Agreement**

On UE-initiated/event-driven beam reporting, **Option-1** is supported as an extension on L1-RSRP report format depending on Event-2.

* Option-1: For each of reported CRI/SSBRI, to introduce additional indication of whether the CRI/SSBRI satisfies the condition of Event-2.
  + The presence of this field is enabled by RRC with subjective to UE capability.
  + Note: The presence of this field is only for the case that N > 1 and the time window and M are configured

Above is NOT applicable for event 1.

**[120] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, one PUCCH resource of first PUCCH can be associated with one or multiple CSI report configurations, regarding Event-2.

* Only a single UEI beam report is carried in the second PUSCH.
  + Additional indication of one ‘CSI report configuration’ is provided in the report format.
    - The CSI report configurations associated with the same PUCCH resource are ordered in ascending order of corresponding *CSI-ReportConfigId*, the number of bits of the additional indication field is ceil(log2(N\_CSIconfig)), where the N\_CSIconfig denotes the number of CSI report configurations associated with the same PUCCH resource.
  + The payload size of the single UEI beam report is determined according to the max payload size among the associated CSI report configurations.
    - Zero-padding can be appended if the payload size of the UEI beam report is less than the max report payload.
  + The reported UEI beam report should satisfy the triggering condition.
  + If multiple UE initiated beam report procedures occur, down-select one of the following options:
    - Option-1: It is up to UE implementation to select one of configuration.
    - Option-2: The UEI beam report with highest priority is reported
    - Option-3: The report triggered in the latest measurement is reported in PUSCH
  + The multiple CSI report configurations associated with the one first PUCCH resource should be configured in the same CC.
  + **Working Assumption**: For Mode-A, the multiple CSI report configurations associated with the same PUCCH resource should be associated with a same *CSI-AperiodicTriggerState*.
  + For Mode-B, the multiple CSI report configurations associated with the same PUCCH resource should be associated with the same second configured PUSCH

FFS: Alt-2 Multiple UEI beam reports associated with the same PUCCH resource for first PUCCH can be transmitted in the second PUSCH.

* If RAN1 cannot converge on the support of Alt-2 in RAN1#120bis, this alternative will be dropped from Rel-19

**[120] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the multiplexing/dropping rule(s) of 1-bit first PUCCH, down-select one of the following rule for the Case-2: the 1-bit first PUCCH is collided/overlapped with a PUSCH

* Option-1: Prioritize first PUCCH over PUSCH, i.e., PUSCH is dropped.
* Option-3: Piggyback 1-bit indication of first PUCCH into the PUSCH.
  + FFS: If the PUSCH should be with UL-SCH or not for UEI beam report
* Option-4: Reuse the SR dropping rules, i.e., the first PUCCH is dropped.
* FFS: whether/how to handle the case of different PHY priorities.
  1. RAN1#119

**[119] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, for the case the pre-configured Type-1 CG PUSCH does NOT carry the beam report, for the second UL channel in Mode-B, Option-2 is supported:

* Option-2: Type-1 CG PUSCH can NOT be transmitted

**[119] Agreement**

On cross-CC beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding Event-2, the following is supported

* the first PUCCH and the second PUSCH associated for UE-initiated/event-driven beam reporting are from the same PUCCH group.
* (working assumption) the first PUCCH and the second PUSCH associated for UE-initiated/event-driven beam reporting are from different PUCCH groups
  + Subject to separate UE capability

**[119] Conclusion**

On cross-CC beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding Event-2, the case that the first PUCCH and the second PUSCH are from the different CG is NOT supported.

**[119] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding first PUCCH channel configuration, down-select one of Alt-1 and Alt-2 for **both mode-A and mode-B.**

* Alt-1 (dedicated SR): Introduce RRC parameter, e.g., *reportResourceRequest-UEIBR/reportNotification-UEIBR*, corresponding to the one-bit indication in the first PUCCH channel
  + The RRC parameter is associated with the dedicated *SchedulingRequestId*.
    - Note: The detailed signaling is up to RAN2.
  + FFS: whether/how to enhance legacy SR to support notification of beam report transmission in Mode-B
* Alt-2 (new UCI type): Introduce RRC parameter, e.g., *firstPUCCHResourceConfig- UEIBR*, for the periodic PUCCH resource configuration.
  + Note: The RRC parameter is NOT associated with *SchedulingRequestId*.
  + 1-bit to PUCCH resource is encoded by reusing the encoding mechanism of positive/negative SR.
  + The dedicated RRC parameter at least comprises the following:
    - *periodicityAndOffset*
    - *PUCCH-ResourceID*
* Above applies at least for the single CC case.
* Reuse multiplexing/dropping rule(s) of SR as baseline
  + FFS: overlapping with SR/LRR or PUSCH

Note: Further details on first PUCCH retransmission for mode A and mode B will be separately discussed.

**[119] Agreement**

On UE-initiated/event-driven beam reporting, for Event 7, the scheme-1 and scheme-2 for deriving ‘RS for current beam’ on Event-2 is reused with the following further interpretation:

* Scheme-1: ‘RS for current beam’ is the QCL RS in the activated TCI state with the Q-th best quality.
* Scheme-2: ‘RS for current beam’ is the SSB which is QCLed with the QCL RS in the activated TCI state with the Q-th best quality.
* Basic feature of **the triggering event determination** for Event-7: Once quality of at least one new beam becomes a threshold value better than the RS derived from the activated TCI state with the Q-th best quality, UE initiated beam report occurs

Note: For Event-2, we have the following definition for scheme-1 and scheme-2

* Scheme-1: RS for current beam is the QCL RS in the indicated TCI state
* Scheme-2: RS for current beam is the SSB which is QCLed with the QCL RS in the indicated TCI state.

**[119] Agreement**

On UE-initiated/event-driven beam reporting, for Event 1, down-select at least one among the following options for RS measurement

* Option-1: RS resource set for new beam is NOT configured in the CSI reporting configuration, and an explicit RRC selection for scheme-1 and scheme-2 is introduced.
* Option-2: RS resource set for new beam is configured in the CSI reporting configuration, and the following implicit manner for enabling one of either scheme-1 or scheme-2 is used:
  + If the RS(s) for new beam are CSI-RS configured in a CSI-RS resource set configured with *repetition*, Scheme-1 is enabled; otherwise, Scheme-2 is enabled.

**[119] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding first PUCCH channel configuration, Alt-2 is supported for both mode-A and mode-B: the first PUCCH channel is a new UCI type

* Alt-2 (new UCI type): Introduce RRC parameter, e.g., *firstPUCCHResourceConfig- UEIBR*, for the periodic PUCCH resource configuration.
  + It is RAN1’s understanding that the RRC parameter is NOT associated with *SchedulingRequestId*.
  + 1-bit to PUCCH resource is encoded by reusing the encoding mechanism of positive/negative SR.
  + The dedicated RRC parameter at least comprises the following:
    - *periodicityAndOffset*
    - *PUCCH-ResourceID*
* Above applies at least for the single CC case.
* Reuse multiplexing/dropping rule(s) of SR as baseline
  + FFS: overlapping with SR/LRR or PUSCH

Note: Further details on first PUCCH retransmission (if supported) for mode A and mode B will be continue to be separately discussed in RAN1.

**[119] Agreement**

Confirm the following working assumption in RAN1#117:

On beam report transmission procedure for UE-initiated/event-driven beam reporting

* For mode-A, at least support one-bit indication in the first PUCCH channel to request a resource for a second UL channel to carry beam report.
  + In such case, a periodic PUCCH resource (with PUCCH format 0/1) is configured by dedicated RRC signaling.
* For mode-B, at least support one-bit indication in the first PUCCH channel to notify a second UL channel to carry beam report.
  + In such case, a periodic PUCCH resource (with PUCCH format 0/1) is configured by dedicated RRC signaling.
* FFS: Whether/how to support multi-bit indication in the first PUCCH for mode-A and mode-B, e.g., when multi-event(s) are approved.
* FFS: details on the dedicated RRC signaling
* Above applies at least for the single CC case.

**[119] Agreement**

On UE-initiated/event-driven beam reporting, at least one of the following is supported as an extension on L1-RSRP report format depending on Event-2.

* Option-1: For each of reported CRI/SSBRI, to introduce additional indication of whether the CRI/SSBRI satisfies the condition of Event-2.
  + The presence of this field is enabled by RRC with subjective to UE capability.
  + The presence of this field is only for the case that N > 1 and the time window and M are configured
* Option-2: For each of reported CRI/SSBRI, to introduce additional indication of the number of Event-2 instances for the CRI/SSBRI(s) within a time window.
  + The presence of this field is enabled by RRC with subjective to UE capability.
  + The presence of this field is only for the case that N > 1 and the time window and M are configured.
* Option-3: No further enhancement.

Note: As agreed in RAN1#117, at least one of the reported CRI/SSBRI(s) should satisfy the condition of Event-2

FFS: Whether/how to handle the case if UE has not sent any first PUCCH associated for UE-initiated/event-driven beam reporting, for Mode-A.

**[119] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the triggering procedure in Step-2 of Mode-A, down-select one of the following options in RAN1#120

* Option-1: A CSI trigger state is dedicated to UE-initiated/event-driven beam reporting, i.e., not associated with legacy AP-CSI report configuration.
* Option-2: A CSI trigger state can be associated with
  + only UE-initiated/event-driven beam reporting
  + or only legacy AP-CSI configuration
  + or UE-initiated/event-driven beam reporting and legacy AP-CSI configuration

**[119] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the multiplexing/dropping rule(s) of 1-bit first PUCCH, further study at least the following cases:

* Case-1: The 1-bit first PUCCH is collided/overlapped with a PUCCH carrying normal SR and/or a PUCCH with normal LRR
* Case-2: The 1-bit first PUCCH is collided/overlapped with a PUSCH
* Case-3: The 1-bit first PUCCHs corresponding to different CSI configuration for UE-initiated/event-driven beam reporting are overlapping in the time domain.

**[119] Agreement**

Study the following to reduce beam application latency after a UEI/ED beam report is sent

* + Alt-1: After confirmation/acknowledgement from NW, apply new beam without RRC configuration signaling or MAC-CE signaling
    - after sending a UE-initiated beam report, the UE could store the QCL properties of the SSB associated with the reference signal reported in the beam report
    - update TCI state(s) with the reported new beam(s)
    - activate new beam(s) without additional SSB reception
  + Alt-2: After receiving a TCI state activation command to activate a TCI state(s), if the new beam(s) associated with the TCI state(s) is reported as synchronized in the UEI/ED beam report, the TCI state(s) becomes applicable for DL reception without additional SSB reception.
    - Note: A reported new beam is determined as synchronized by UE, if the UE stores the QCL properties associated with the reported new beam(s) after the UEI/ED beam report is sent
    - FFS: How to inform a reported new beam in a UEI/ED beam report (i.e., introducing one-bit indicator for each reported new beam or all the reported new beam are assumed to be synchronized)
  + Alt-3: After sending a UE-initiated beam report, the UE could store the QCL properties of the SSB associated with the reference signal reported in the beam report.
    - In such case, at the reception of a subsequent reception of Unified TCI States Activation/Deactivation MAC CE, the UE activates new beam(s) without additional SSB reception
  + Other alternatives are not precluded

**[119] Agreement**

On UE-initiated/event-driven beam reporting, regarding trigger events, the following working assumption in RAN1#118bis is confirmed:

On UE-initiated/event-driven beam reporting, regarding trigger events, besides for Event-2, Event-1 and Event-7 are both supported.

* Event-1: Quality of the current beam is worse than a certain threshold.
* Event-7: Quality of at least one new beam, such as L1-RSRP, becomes a threshold value better than the RS derived from the activated TCI state with the Q-th best quality.
  + Q is RRC configured with subjective to UE capability signalling
    - UE may only indicate a single candidate value or not support Event-7.
* The additionally supported events will reuse the same design as event 2 – unless there is consensus to do otherwise
* The additionally supported events will be lower priority compared to event 2.

**[119] Agreement**

Regarding for the evaluation periodicity for determining Event-2 instance [at least when DRX is not configured], at least **Alt-1** is supported for the single-CC beam reporting (for case that the CSI report configuration and RS for the current beam and new beam(s) are in the same CC).

* Alt-1: The periodicity of the current beam RS should be the same as that of the new beam RS(s).
  + The evaluation periodicity is the same as the periodicity of the current and new beam RS(s).
* Alt-2: The periodicity of the current beam RS can be different from that of the new beam RS(s)
  + Alt-2\_1: The evaluation periodicity is the same as the periodicity of the current beam RS.
  + Alt-2\_2: The evaluation periodicity is the same as periodicity of the new beam RS.
  + Alt-2\_3: The evaluation periodicity is the same as shortest periodicity of the current beam RS and new beam RS(s).
  + Alt-2\_4: The evaluation periodicity is the maximum of {X ms, shortest periodicity of the current beam RS and new beam RS(s)}.
  + Alt-2\_5: The evaluation periodicity is the same as largest periodicity of the current beam RS and new beam RS(s).

Note: There is the same periodicity for the new beam RS(s).

FFS: Down-selection among above Alt(s) for cross-CC beam reporting.

Strong concerns were expressed by Huawei and CATT that if only Alt-1 is supported in the end, the feature will not be practical.

Send an LS to RAN4. Final LS in R1-2410914.

* 1. RAN1#118-bis

**[118b] Agreement**

On UE-initiated/event-driven beam reporting, regarding L1-RSRP report format Option-3 depending on Event-2,

* The differential L1-RSRP is quantized to a 4-bit value with 2 dB step size

**[118b] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the triggering procedure in Step-2 of Mode-A

* Reuse CSI request field in DCI format 0\_1/0\_2 to trigger the transmission of the UEI beam report
  + If a CSI trigger state associated with UEI beam report configuration(s) is indicated by the CSI request field in DCI format 0\_1/0\_2, the UE transmits the corresponding UEI beam report(s) in the second PUSCH scheduled by the DCI format 0\_1/0\_2
  + FFS: DCI format 0\_3
* FFS: Whether a CSI trigger state should be dedicated to UE-initiated/event-driven beam reporting, i.e., not associated with legacy AP-CSI report configuration.

**[118b] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, resource mapping/configuration between first and second UL channel in Mode-B, at least Option-1 is supported

* Option-1 (one-to-one): Only one periodic PUCCH resource for the first channel and only one pre-configured resource for second UL channel can be associated with the CSI report configuration for UE-initiated/event-driven beam reporting.
  + Down-select one of the following in RAN1#118bis
    - Option-1A: Same periodicity between first PUCCH resource and pre-configured resource for second UL channel.
    - Option-1B: No restriction in terms of periodicity.

**[118b] Agreement**

On cross-CC beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding Event-2, for both Mode-A and Mode-B, the first PUCCH and the second PUSCH can be from the same or different CC(s)

* FFS: whether the first PUCCH and the second PUSCH should be from the same PUCCH group
* The first PUCCH and the second PUSCH should be in the same CG
  + FFS: Different CGs

**[118b] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, for the case the pre-configured Type-1 CG PUSCH carry the beam report, for the second UL channel in **Mode-B**, at least option3 is supported:

* Option-1: The same Type-1 CG PUSCH can carry UL-SCH, any other UCI, and the beam report.
* Option-2: The Type-1 CG PUSCH is a dedicated type-1 CG PUSCH for carrying the beam report
  + Note: This PUSCH can NOT carry UL-SCH. This PUSCH can NOT carry any other UCI.
* Option-3: The Type-1 CG PUSCH is a type-1 CG PUSCH for carrying the beam report
  + Note: This PUSCH can NOT carry UL-SCH. This PUSCH can carry any other UCI.

FFS: whether Type-1 CG PUSCH can be transmitted if the pre-configured Type-1 CG PUSCH does NOT carry the beam report

**[118b]Working Assumption**

The following working assumption in RAN1#118 is revised in red.

On UE-initiated/event-driven beam reporting, regarding trigger events, besides for Event-2, Event-1 and Event-7 are both supported.

* Event-1: Quality of the current beam is worse than a certain threshold.
* Event-7: Quality of at least one new beam, such as L1-RSRP, becomes a threshold value better than the RS derived from the activated TCI state with the ~~M-th~~ Q-th best quality.
  + ~~M~~ Q is RRC configured with subjective to UE capability signalling
    - UE may only indicate a single candidate value or not support Event-7.
* The additionally supported events will reuse the same design as event 2 – unless there is consensus to do otherwise
* The additionally supported events will be lower priority compared to event 2.

**[118b] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding resource mapping/configuration between first and second UL channel associated with a same CSI report configuration in Mode-B,

* The UE expects that there is the same periodicity (in ms) between first PUCCH resource and pre-configured resource for second UL channel.
  + FFS: Whether first PUCCH resource and pre-configured resource for second UL channel can have different periodicities (in ms)

**[118b] Agreement**

Regarding RS measurement for the current beam for Event 2, for Option-2a, besides for scheme-1 and scheme-2, there is no RAN1 consensus on the following enhancement for handling the case that only one TRS is configured in the indicated TCI state in RAN1#118bis

* Option-1: Introducing additional scheme: the RS for current beam can be a CSI-RS for beam management derived from the QCL RS in the indicated TCI state;
* Option-2: Further support TRS as measurement RS of current beam for determining L1-RSRP
* Option-3: Introducing additional scheme: The RS for current beam is explicitly configured by RRC or MAC-CE (Option-2C in RAN1 116b agreement).

Note 3: When only one TRS is configured in the indicated TCI state, either Scheme-1(working assumption) or Scheme-2 is used where enabling one of either Scheme-1 or Scheme-2 is selected by NW.

When the Scheme-1 is used, the UE assumes that the CSI-RS resource in the indicated TCI state is configured in a CSI-RS resource set configured with repetition.

**[118b] Agreement**

Regarding RS measurement for the current beam for Event 2, for Option-2a, confirm the following working assumption

* Note 3: When only one TRS is configured in the indicated TCI state, either Scheme-1~~(working assumption)~~ or Scheme-2 is used where enabling one of either Scheme-1 or Scheme-2 is selected by NW.

**[118b] Agreement**

Regarding RS measurement for the current beam for Event 2, for Option-2a, the following working assumption in RAN1#117 is confirmed with modification:

* (**Working Assumption**) Enabling of either Scheme-1 or Scheme-2 should ensure the same RS type for RS measurement for current beam and new beam.
  + Note: In such case, the RS type comprises SSB and CSI-RS configured in a CSI-RS resource set configured with *repetition*.

**[118b] Agreement**

Regarding RS measurement for the current beam for Event 2, for enabling one of either Scheme-1 or Scheme-2 by NW in Option-2a, the following implicit manner is supported:

* If the RS(s) for new beam are CSI-RS configured in a CSI-RS resource set configured with *repetition*, Scheme-1 is enabled; otherwise, Scheme-2 is enabled.

**[118b] Agreement**

Regarding the triggering event determination for Event 2, the event instance(s) counting is per new beam. Further study candidate condition(s) of resetting the counting including whether resetting is needed.

**[118b] Agreement**

Regarding the triggering event determination for Event 2, down-select among the following alternatives for the evaluation periodicity for determining Event-2 instance [at least when DRX is not configured]

* Alt-1: The periodicity of the current beam RS should be the same as that of the new beam RS(s).
  + The evaluation periodicity is the same as the periodicity of the current and new beam RS(s)
* Alt-2: The periodicity of the current beam RS can be different from that of the new beam RS(s)
  + Alt-2\_1: The evaluation periodicity is the same as the periodicity of the current beam RS;
  + Alt-2\_2: The evaluation periodicity is the same as periodicity of the new beam RS;
  + Alt-2\_3: The evaluation periodicity is the same as shortest periodicity of the current beam RS and new beam RS(s):
  + Alt-2\_4: The evaluation periodicity is the maximum of {X ms, shortest periodicity of the current beam RS and new beam RS(s)}:
  + Alt-2\_5: The evaluation periodicity is the same as largest periodicity of the current beam RS and new beam RS(s):

Note: There is the same periodicity for the new beam RS(s).

**[118b] Agreement**

On cross-CC beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding Event-2, the following is supported

* For new beam measurement, in a CSI report configuration, configure legacy RRC parameter *carrier* that indicates the CC that the RS resource set associated with the CSI reporting configuration can be found
* FFS: Whether the current beam RS and new beam RS(s) can be in the same CC or in different CCs, regarding cross-CC beam measurement.
* FFS: Whether the indicated TCI state and new beam RS(s) can be in the same CC or in different CCs, regarding cross-CC beam measurement.

**[118b] Conclusion**

There is no RAN1 consensus on the following proposal:

On UE-initiated/event-driven beam reporting, regarding L1-RSRP report format Option-3 depending on Event-2, the candidate value of ‘N’ can further comprise {5, 6, 7, 8}, besides for previously agreed candidate value of {1, 2, 3, 4}.

* 1. RAN1#118

**[118] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, for regarding Mode-B, the pre-configured resource(s) for the second channel in Step-2 is at least type 1 CG-PUSCH.

* FFS: PUCCH as the second channel
* FFS: Whether the PUSCH can be with UL data

**[118] Agreement**

Regarding explicit RS configuration for new beam measurement for Event 2, at least Option-1 is supported

* + Option-1: The RS(s) for new beam(s) are explicitly configured in one RS resource set associated with an CSI reporting configuration
  + If legacy UE capability signaling cannot be reused, introduce a UE capability signaling of indicating the maximum number of the configured RS(s) in the RS resource set.
  + FFS: The RS in the RS resource set can be updated by MAC-CE

**[118] Agreement**

On UE-initiated/event-driven beam reporting, regarding L1-RSRP report format Option-3 depending on Event-2, the following differential L1-RSRP report format is supported.

|  |
| --- |
| CRI or SSBRI #1 |
| CRI or SSBRI #2 |
| … |
| CRI or SSBRI #N |
| L1-RSRP #1 |
| Differential L1-RSRP #2 |
| … |
| Differential L1-RSRP #N |
| Differential L1-RSRP for current beam, if report mode that current beam is always reported is enabled by RRC |
| Note: Other contents are not precluded |

.

* + - Differential L1-RSRP #2~#N/current beam is determined based on the difference between measured L1-RSRP corresponding to the CRI/SSBRI #2~#N/current beam and the measured L1-RSRP corresponding to CRI/SSBRI #1
      * L1-RSRP#1 is the largest measured RSRP among reported ones, and an absolute L1-RSRP.
      * FFS: range and step size of differential L1-RSRP
    - FFS: Whether/how to report additional indication of which CRI/SSBRI(s) satisfy the condition of Event-2.
    - FFS: Additional report content(s) (e.g., reporting configuration ID, indication for synchronization state, event ID, or cell ID).

**[118] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the dedicated RRC signaling for first PUCCH channel configuration for **Mode-A**, down-select one of the following

* Alt-1 (dedicated SR for mode-A): Introduce RRC parameter, e.g., *reportResourceRequest-UEIBR*, corresponding to the one-bit indication in the first PUCCH channel
  + The RRC parameter is associated with the dedicated *SchedulingRequestId*.
    - Note: The detailed signaling is up to RAN2.
* Alt 2 (new UCI type): Introduce RRC parameter, e.g., *firstPUCCHResourceConfig-ModeA-UEIBR*, for the periodic PUCCH resource configuration.
  + Note: The RRC parameter is NOT associated with *SchedulingRequestId*.
  + FFS: how to encode 1-bit to PUCCH resource, e.g., reuse encoding mechanism of positive/negative SR.
  + The dedicated RRC parameter at least comprises the following:
    - *periodicityAndOffset*
    - *PUCCH-ResourceID*
* Above applies at least for the single CC case.

**[118] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the dedicated RRC signaling for first PUCCH channel configuration for **Mode-B**, down-select one of the following

* Alt 1 (dedicated SR for mode-B): Introduce RRC parameter, e.g., *reportNotification-UEIBR*, corresponding to the one-bit indication in the first PUCCH channel
  + The RRC parameter is associated with the dedicated *SchedulingRequestId*.
    - Note: The detailed signaling is up to RAN2.
* Alt 2 (new UCI type): Introduce RRC parameter, e.g., *firstPUCCHResourceConfig-ModeB-UEIBR*, for the periodic PUCCH resource configuration.
  + Note: The RRC parameter is NOT associated with *SchedulingRequestId*.
  + FFS: how to encode 1-bit to PUCCH resource, e.g., reuse encoding mechanism of positive/negative SR.
  + The dedicated RRC parameter at least comprises the following:
    - *periodicityAndOffset*
    - *PUCCH-ResourceID*
* Above is at least applied to a single CC case.

**[118] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding the triggering procedure in Step-2 of Mode-A, select one of the following options

* Option-1: Introduce a new 1-bit field in DCI format 0\_1/0\_2 to trigger the transmission of the UEI beam report
  + FFS: DCI format 0\_3
* Option-2: Reuse CSI request field in DCI format 0\_1/0\_2 to trigger the transmission of the UEI beam report
  + FFS: DCI format 0\_3
* FFS: Whether/how to handle the case that multiple CSI report configuration(s) for the UE-initiated/event-driven beam report are associated with the same first PUCCH resource and/or the same scheduled PUSCH

**[118] Conclusion**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding Mode-A, there is no RAN1 consensus on additionally supporting that the DCI format in Step-2 comprises DL-grant DCI format, and the second channel in Step-3 is PUCCH.

**[118] Agreement**

On UE-initiated/event-driven beam reporting, regarding L1-RSRP report format Option-3 depending on Event-2, the candidate value of ‘N’ at least comprises {1, 2, 3, 4}

* FFS: additional candidate value(s) of {5, 6, 7, 8}
* FFS: If ‘N’ is not RRC configured, only one L1-RSRP and CRI/SSBRI are reported by default.

**[118] Agreement**

Regarding RS measurement for the current beam for Event 2, for Option-2a, besides for scheme-1 and scheme-2, further down-select one of the following for handling the case that only one TRS is configured in the indicated TCI state in RAN1#118bis

* Option-1: Introducing additional scheme: the RS for current beam can be a CSI-RS for beam management derived from the QCL RS in the indicated TCI state;
* Option-2: Further support TRS as measurement RS of current beam for determining L1-RSRP
* Option-3: Introducing additional scheme: The RS for current beam is explicitly configured by RRC or MAC-CE (Option-2C in RAN1 116b agreement).
* Option-4: No further enhancement

Note: If there is no consensus in RAN1 on one of Options 1/2/3, Option 4 will be taken.

**[118] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, for the case the pre-configured Type-1 CG PUSCH carry the beam report, for the second UL channel in **Mode-B**, at least one or both of the following should be supported:

* Option-1: The same Type-1 CG PUSCH can carry UL-SCH and the beam report.
* Option-2: The Type-1 CG PUSCH is a dedicated type-1 CG PUSCH for carrying the beam report
  + Note: This PUSCH can NOT carry UL-SCH. This PUSCH can NOT carry any other UCI.

**[118] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding Mode-B, UEI beam report is carried on a first available transmission occasion of the second UL channel X symbols after sending the last symbol of report notification on the first PUCCH channel.

**[118] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding resource mapping/configuration between first and second channel in Mode-B, for a given CSI report configuration, the following is provided for down-selection.

* Option-1 (one-to-one): Only one first PUCCH resource and only one pre-configured resource for second UL channel can be associated with the CSI report configuration for UE-initiated/event-driven beam reporting.
  + Option-1A: Same periodicity between first PUCCH resource and pre-configured resource for second UL channel.
  + Option-1B: No restriction in terms of periodicity.
* Option-2 (one-to-M): Only one first PUCCH resource and one or more pre-configured resource(s) for second UL channel can be associated with CSI report configuration for UE-initiated/event-driven beam reporting.

**[118] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding Event-2, for at least Mode-B, the beam report should be carried in the second UL channel in the CC where the corresponding CSI report configuration is configured.

* Above applies to both cross-CC and same-CC beam report.
* Note: Above is applied to the case that second UL channel is PUSCH.
* FFS: Whether the first and second channels can be from the same/different CC.

**[118] Working Assumption**

On UE-initiated/event-driven beam reporting, regarding trigger events, besides for Event-2, Event-1 and Event-7 are both supported.

* Event-1: Quality of the current beam is worse than a certain threshold.
* Event-7: Quality of at least one new beam, such as L1-RSRP, becomes a threshold value better than the RS derived from the activated TCI state with the M-th best quality.
  + M is RRC configured with subjective to UE capability signalling
    - UE may only indicate a single candidate value or not support Event-7.
* The additionally supported events will reuse the same design as event 2 – unless there is consensus to do otherwise
* The additionally supported events will be lower priority compared to event 2.

**[118] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding **Mode-A and/or Mode-B**, further study the following for first PUCCH transmission

* UCI multiplexing/dropping/prioritization rule
* Conditions for the transmission of the first PUCCH.
* Whether the PUCCH resource in the first PUCCH channel can be associated with multiple CSI report configurations for UE-initiated/event-driven beam reporting from one or multiple CC(s).
* Whether/how to re-transmit the first PUCCH channel.

Whether/how to apply prohibit-timer or maximum number of (re)transmission(s) for first PUCCH channel.

* 1. RAN1#117

**[117] Agreement**

On UE-initiated/event-driven beam reporting, regarding UL signaling content(s) of L1-RSRP report depending on Event-2, in a report instance, at least Option-3 is supported

* Option-3: N ≥ 1 beam(s) are reported in the report instance,
  + At least one of N reported beam(s) should satisfy the condition of Event-2
  + N is configured by gNB
    - FFS: candidate value of ‘N’.
  + FFS: RRC can enable or disable whether current beam is always reported in addition to the N beams
* FFS: Option-1/1a/1b/2.
* Above applies at least for the single CC case

**[117] Working Assumption**

On beam report transmission procedure for UE-initiated/event-driven beam reporting

* For mode-A, at least support one-bit indication in the first PUCCH channel to request a resource for a second UL channel to carry beam report.
  + In such case, a periodic PUCCH resource (with PUCCH format 0/1) is configured by dedicated RRC signaling.
* For mode-B, at least support one-bit indication in the first PUCCH channel to notify a second UL channel to carry beam report.
  + In such case, a periodic PUCCH resource (with PUCCH format 0/1) is configured by dedicated RRC signaling.
* FFS: Whether/how to support multi-bit indication in the first PUCCH for mode-A and mode-B, e.g., when multi-event(s) are approved.
* FFS: details on the dedicated RRC signaling
* Above applies at least for the single CC case.

**[117] Agreement**

Regarding RS measurement for the current beam for Event 2, for Option-2a, support the both schemes as follows.

* Scheme-1: RS for current beam is the QCL RS in the indicated TCI state
  + FFS: Whether/How to handle the case if only one TRS is configured in the indicated TCI state.
* Scheme-2: the RS for current beam is the SSB which is QCLed with the QCL RS in the indicated TCI state.
* Enabling one of either Scheme-1 or Scheme-2 is selected by NW.
  + FFS: The above selection is via an explicit RRC parameter or an implicit manner, e.g., if the RS(s) for new beam are CSI-RS, Scheme-1 is enabled; otherwise, Scheme-2 is enabled.
  + (**Working Assumption**) Enabling of either Scheme-1 or Scheme-2 should ensure the same RS type for RS measurement for current beam and new beam.
* The above QCL RS is the RS w.r.t. QCL-TypeD, if there are two QCL RSs in the indicated TCI state.

**[117] Agreement**

Regarding RS measurement for the new beam for Event 2, at least Option-3a is supported

* Option-3a (explicit manner): The RS(s) for new beam(s) are explicitly configured
* FFS: Option-3b/3c
  + Option-3b: The RS(s) for new beam(s) are implicitly derived from QCL RS(s) of activated TCI state(s).
  + Option-3c: The RS(s) for new beam(s) are implicitly derived from QCL RS(s) of TCI state(s) in a configured subset of the legacy RRC-configured TCI state list

**[117] Agreement**

On UE-initiated/event-driven beam reporting, regarding L1-RSRP report format Option-3 depending on Event-2, for a report instance where N ≥ 1 beam(s) are reported, the following is supported.

* RRC can enable or disable whether current beam is always reported
  + - When enabled by RRC, the current beam + N beams from the measurement RSs for new beam(s) are reported
      * Note: The reported current beam is NOT counted in the N reported beams.
    - When disabled by RRC, N beams are reported.

**[117] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, regarding Mode-A, the DCI format in Step-2 comprises UL-grant DCI format, and the second channel in Step-3 is at least PUSCH.

* The UL-grant DCI format at least comprises DCI format 0\_1/0\_2.
  + FFS: DCI format 0\_3
* FFS: How to trigger the UEI beam report by the UL-grant DCI format
* FFS: the DCI format in Step-2 comprises DL-grant DCI format, and the second channel in Step-3 is PUCCH.
  + - 1-bit field in the DL-grant DCI format is introduced to indicate the transmission of the UEI beam report
      * The PUCCH resource for HARQ-ACK transmission can be reused to carry both the HARQ-ACK and UEI beam report.
    - The DL-grant DCI format at least comprises DCI format 1\_1/1\_2.
      * FFS: DCI format 1\_3

**[117] Agreement**

Regarding the triggering event determination for Event 2:

* If within a time window (which is configurable), the number of Event-2 instance(s) for at least one same new beam is greater than or equal to a configurable number M, UE initiated beam report occurs.
  + Note: Event-2 instance for a new beam is determined if the L1-RSRP of the new beam becomes a threshold value better than the current beam

Above feature is subject to UE capability.

* Basic feature: Once the L1-RSRP of the new beam becomes a threshold value better than the current beam, UE initiated beam report occurs

FFS: Whether the above is captured in RAN1 or RAN2 specification.

**[117] Agreement**

On UE-initiated/event-driven beam reporting, regarding trigger events, the following Event-1 and 7a/7b, are provided for down-selection or combination in RAN1#118 (possible outcome is that no new event is supported)

* Event-1: Quality of the current beam is worse than a certain threshold.
* Event-7a: Quality of at least one new beam, such as L1-RSRP, becomes a threshold value better than the RS derived from the activated TCI state with the **worst** quality.
* Event-7b: Quality of at least one new beam, such as L1-RSRP, becomes a threshold value better than the RS derived from the activated TCI state with the **best** quality.

**[117] Agreement**

Regarding explicit RS configuration for new beam measurement for Event 2, down-select the following options in the RAN1#118:

* Option-1: The RS(s) for new beam(s) are explicitly configured in one RS resource set associated with an CSI reporting configuration;
  + FFS: The RS in the RS resource set can be updated by MAC-CE.
* Option-2: A list of RS(s) for new beam measurement can be configured by RRC, and a subset can be activated for new beam measurement by MAC-CE.
  + FFS: If a list size is small, MAC-CE activation is not needed
* Option-3: A list of RS resource(s) for new beam measurement can be configured by RRC, and a subset of RS resource(s) in the list can be provided for new beam measurement by indicated TCI state.
* Others are not precluded.
* FFS: Each RS for new beam measurement should be associated with a configured joint/DL TCI state which can be used as the indicated TCI state

**[117] Agreement**

Regarding RS measurement for the current beam for Event 2, for Option-2a, besides for scheme-1 and scheme-2, further study the following for handling the case that only one TRS is configured in the indicated TCI state.

* Option-1: Introducing additional scheme: the RS for current beam can be a CSI-RS for beam management derived from the QCL RS in the indicated TCI state;
* Option-2: Further support TRS as measurement RS of current beam for determining L1-RSRP
* Option-3: Introducing additional scheme: The RS for current beam is explicitly configured by RRC or MAC-CE (Option-2C in RAN1 116b agreement).
* Option-4: No further enhancement (i.e., in such case, Scheme-2 is used)
* Others are not precluded.
  1. RAN1#116-bis

**[116b] Agreement**

On beam report transmission procedure for UE-initiated/event-driven beam reporting, following modes are supported:

* Mode A (dynamically scheduling UCI by gNB):
  + Step 1: UE transmits a first PUCCH (one-bit/multi-bit) to request a resource for a second UL channel to carry beam report
    - FFS: Request format, e.g., SR or a new UCI type.
  + Step 2: UE detects the DCI format to indicate a resource for a second UL channel to carry beam report.
  + Step 3: Beam report is transmitted in second UL channel.
    - FFS: Details on the second UL channel, e.g., whether the second UL channel is PUCCH, PUSCH or both
  + This mode is basic UE capability (i.e. all UE supporting UE-initiated/event-driven beam reporting should support this feature).
  + No new DCI format is introduced.
* Mode B (UCI in pre-configured resource(s) for second UL channel):
  + Step 1: UE transmits a first PUCCH (one-bit/multi-bit) notifying a second UL channel to carry beam report
    - FFS: Notification format, e.g., SR or a new UCI type.
  + Step 2: UE transmits the beam report in the second UL channel.
    - FFS: Details on the second UL channel, e.g., whether the second UL channel is PUCCH, PUSCH or both
  + The notification in Step1 is in a separate reporting instance from the beam report in Step 2.

FFS: Whether UE receives acknowledge information with response to each step for all modes

For above procedures, cross-CC beam reporting is supported for both modes.

* FFS: Details.

**[116b] Agreement**

On UE-initiated/event-driven beam reporting, regarding trigger-event detection for beam reporting, at least support Event-2: Quality of at least one new beam, such as L1-RSRP, becomes a threshold value better than the current beam.

* At least L1-RSRP is supported as quality metrics used for Event-2
  + FFS: How the L1-RSRP is used to determine the triggering event (e.g. timer, counter, filter coefficient)
  + FFS: Whether the network controls how the L1-RSRP is used to determine the triggering event
* Regarding RS measurement for the new beam for Event-2, down-select one or more of the following:
  + Option-3a (explicit manner): The RS(s) for new beam(s) are explicitly configured by RRC (e.g., reusing legacy configuration of RS measurement or in *TCI-State*) or MAC-CE
  + Option-3b (implicit manner): The RS(s) for new beam(s) are implicitly derived from QCL RS(s) of activated TCI state(s).
  + Option-3c (implicit manner): The RS(s) for new beam(s) are implicitly derived from QCL RS(s) of configured TCI state(s).
* Note-1: ‘New/current beam’ is for discussion purpose.
* Note-2: Other trigger events/quality metrics (e.g., L1-SINR) are not precluded.
* Note-3: For above implicit manner(s), if there are two QCL RSs in a TCI state, the measurement RS is derived from RS w.r.t. QCL-TypeD, if applicable.

**[116b] Agreement**

On UE-initiated/event-driven beam reporting, regarding Event-2, the threshold value is RRC configured

**[116b] Agreement**

On UE-initiated/event-driven beam reporting, regarding Event-2, ‘current beam’ is a beam corresponding to the indicated TCI state.

* Regarding RS measurement for the current beam for Event-2, Option-2a is supported:
  + Option-2a (implicit manner): The RS for current beam is implicitly derived from a QCL RS of indicated TCI state.
    - FFS: The RS for current beam can be either the QCL RS in the indicated TCI state or the SSB which is QCLed with the QCL RS in the indicated TCI state.
  + FFS: Option-2c (explicit manner): The RS for current beam is explicitly configured by RRC or MAC-CE.
    - Note: SSB or CSI-RS can be configured

**[116b] Agreement**

On UE-initiated/event-driven beam reporting, further study the following trigger events:

* Event-1: Quality of the current beam is worse than a certain threshold.
* Event-3: Quality of a new beam is better than a certain threshold.
* Event-4: Quality of the current beam is worse than a threshold 1, and quality of at least one new beam is better than a threshold 2.
* Event-5: Absolute value of the difference between the quality of the current beam and the quality of at least one new beam is lower than a threshold.
* Event-6: When the current beam is not in the best K>1 beams (out of configured beams for measurement and reporting).
* Event-7a: Quality of at least one new beam, such as L1-RSRP, becomes a threshold value better than the RS derived from the activated TCI state with the **worst** quality.
* Event-7b: Quality of at least one new beam, such as L1-RSRP, becomes a threshold value better than the RS derived from the activated TCI state with the **best** quality.
* Event-8: Quality of M>1 new beams, such as L1-RSRP, become a threshold value better than the current beam.
* Event-9: Quality of at least one new beam, such as L1-RSRP, becomes a threshold value better than the configured reference RS (can be SSB or CSI-RS).

**[116b] Agreement**

On UE-initiated/event-driven beam reporting, regarding UL signaling content(s) of L1-RSRP report depending on Event-2, in a report instance, the following options are provided for down-selection (other options are not precluded) in RAN1#117

* Option-1 (variable size): N beam(s) are reported in the report instance, where N {1, 2, ..., Nmax}
  + The N beam(s) should satisfy the condition of Event-2
  + Nmax is configured by gNB
  + FFS: Whether the indication of payload size should be provided additionally.
* Option-1a (variable size): N beam(s) are reported in the report instance, where N {1, 2, ..., Nmax}
  + At least one of N reported beam(s) should satisfy the condition of Event-2
  + Nmax is configured by gNB
  + FFS: Whether the indication of payload size should be provided additionally.
  + FFS: Details on how value of N is determined by the UE
* Option-1b: N beam(s) are reported in the report instance, where N {1, 2, ..., Nmax}
  + The N beam(s) should satisfy the condition of Event-2
  + Nmax is configured by gNB
  + Payload size does not vary as a function of N
  + FFS: Zero-padding can be provided if N is less than Nmax.
* Option-2: Only N=1 beam is reported in the report instance
  + The reported beam should satisfy the condition of Event-2
* Option-3: N ≥ 1 beam(s) are reported in the report instance,
  + At least one of N reported beam(s) should satisfy the condition of Event-2
  + N is configured by gNB
* Other options are not precluded.
* FFS: Whether the measurement results for current beam is always reported or can be enabled by RRC.
* FFS: When current beam is reported, whether the current beam is counted in the N reported beams.
* The selected option shall satisfy Event-2.
  1. RAN1#116

**[116] Agreement**

On UE-initiated/event-driven beam report, at least of following aspects should be included:

* Trigger-event detection for beam reporting by UE
  + UE monitors RS to assess if a beam-reporting trigger condition has been met
  + FFS: Trigger condition for declaring beam-reporting event
* Beam-report transmission by UE
  + Signaling contents in the beam report
  + Down-selection one or more options (strive for one) between the following options as signaling medium/container for beam report transmission
    - MAC-CE
    - UCI
    - Others are not precluded.

On UE-initiated/event-driven beam report, the following aspects may be included:

* UE requesting UL resource(s) for the beam report
* UE notifying transmission of beam report
* gNB preconfigured resources

Other procedure(s) as required

**[116] Agreement**

On UE-initiated/event-driven beam reporting, regarding trigger-event detection for beam reporting, RAN1 further study at least the following aspects: quality metrics, event-definition and threshold.

* Further study trigger events, including the following example as a starting point
  + Event-1: Quality of the current beam is worse than a certain threshold.
  + Event-2: Quality of at least one new beam, such as L1-RSRP, becomes a threshold value better than the current beam.
  + Event-3: Quality of a new beam is better than a certain threshold.
  + Event-4: Quality of the current beam is worse than a threshold 1, and quality of at least one new beam is better than a threshold 2.
  + Others are not precluded.
* Note: Companies are encouraged to provide details on procedure (e.g. how it is used) related to their preferred event

**[116] Agreement**

On UE-initiated/event-driven beam reporting, at least support L1-RSRP as a measurement quantity on SSB for intra-cell and inter-cell, and periodic CSI-RS for beam management

* Notes: measurement results may be contained in the beam report and/or used as quality metric(s) to initiate/trigger the reporting.
* FFS: Semi-persistent CSI-RS and aperiodic CSI-RS.
* FFS: Whether/how to support L1-SINR measurement, assuming legacy RS or RS combination (e.g., CMR only, CMR+ZP/NZP-IMR) for Rel-16 SINR is reused.
* FFS: Whether/how to specify filtering operation for L1-RSRP.

**[116] Agreement**

On UE-initiated/event-driven beam reporting, regarding signaling content(s), at least support DL RS resource indicator and L1-RSRP

* FFS: Study and decide whether additional contents can be supported.
* FFS: L1-RSRP format, e.g., absolute and/or differential value.
* Note: Above does not imply to preclude discussion on L1-RSRP filtering.
* The actual reported content depends on the triggering event
  + Support of one or multiple events will be discussed separately

# References

|  |  |  |  |
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