[100b-e-NR-5G\_V2X\_NRSL-PHYstructure-01]

Email discussion/approval regarding TBS determination for PSSCH

[100b-e-NR-5G\_V2X\_NRSL-PHYstructure-01] Email discussion/approval regarding TBS determination for PSSCH   
   - A. How to deal with PSFCH overhead  
   - B. How to deal with PSSCH DMRS overhead  
   - C. How to deal with 2nd SCI overhead  
   - D. How to deal with CSI-RS/PT-RS  
   - E. Whether/how to use indication of sl\_xOverhead

till 4/27, with potential TP till 4/30 – Jeongho (SS)

This document has the following questions.

A. How to deal with PSFCH overhead in determination of TBS for PSSCH?

B. How to deal with PSSCH DMRS overhead in determination of TBS for PSSCH?

C. How to deal with the 2nd SCI overhead in determination of TBS for PSSCH?

D. How to deal with SL CSI-RS and PT-RS in determination of TBS for PSSCH?

E. Whether and how to define/use high layer parameter sl\_xOverhead for determination of TBS for PSSCH?

# **A. How to deal with PSFCH overhead in determination of TBS for PSSCH?**

Based on the submitted contributions, there are the following alternatives and supporting companies.

* Alt A-1. The number of PSSCH symbols are based on the slot having the PSSCH (i.e., dynamically changed)
  + [LGE], [Panasonic]
* Alt A-2. The number of PSSCH symbols are obtained as the average on the all slots in the resource pool. (e.g., if N=2, then the average value can be 3 symbols divided by 2, where 3 symbols includes additional gap symbol and 2 PSFCH symbols).
  + [Huawei, HiSilicon], [ZTE, Sanechips], [Nokia, NSB], [CATT]
* Alt A-3. The overhead due to PSFCH is indicated by the corresponding 1st SCI.
  + [OPPO], [Ericsson](based on the initial Tx)
* Alt A-4. The overhead due to PSFCH is indicated by the corresponding 2nd SCI.
  + [Qualcomm]
* Alt A-5. The number of PSSCH symbols are obtained as the maximum on the all slots in the resource pool. (i.e. always assume there is PSFCH in the slot) (e.g., if N=2, then the overhead value is 3 symbols, where 3 symbols includes additional gap symbol and 2 PSFCH symbols).
  + [vivo], [Spreadtrum]
* Alt A-6. A pre-configured parameter is used for the actual overhead for PSFCH. (FFS: the pre-configured parameter can be the same as “sl\_xOverhead” or separate from it.
  + [Intel], [Apple], [NEC], [NTT DCM]

Based on the contributions, the following proposal can be made.

*Proposal 1. The number of PSSCH symbols are obtained as the average on the all slots in the resource pool. (e.g., if N=2, then the average value can be 3 symbols divided by 2, where 3 symbols includes additional gap symbol and 2 PSFCH symbols).*

Please share your views if Proposal 1 is agreeable or, if not, please share your views on the reason why it is not workable. When sharing views, please share you views on FFS, if there is, to be discussed together.

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| **Company** | **Views** |
| NTT DOCOMO | Motivation of ‘average’ is unclear for us. In our understanding, overhead that is dynamically changed should be considered by xOverhead. This is principle in Uu. The same principle should be adopted for SL.  # In our contribution, we support Alt A-6. Our company is added in the above. |
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# **B. How to deal with PSSCH DMRS overhead in determination of TBS for PSSCH?**

Based on the submitted contributions, there are the following alternatives and supporting companies.

* Alt B-1. Consider the reference DMRS overhead as configured. (i.e., there is a new RRC parameter to indicate)
  + [Huawei, HiSilicon], [Intel], [Apple]
* Alt B-2. Include DMRS overhead in sl\_xOverhead
  + [LGE], [Ericsson], [Spreadtrum], [NEC]
* Alt B-3. Actual number of REs for DMRS (i.e. reuse Rel-15 NR Uu) (FFS: actual number of REs, or number of Res per PRBs for PSSCH times the number of DMRS symbols, this is to be discussed together due to PSCCH overlap.)
  + [ZTE, Sanechips], [vivo], [OPPO], [NTT DCM], [Qualcomm], [Mitsubishi]
* Alt B-4. Actual number of REs for DMRS, and UE indicates the same DMRS pattern between initial transmission and retransmission.
  + [vivo]
* Alt B-5. Assume the maximum density among configured patterns
  + [CATT]

Based on the contributions, the following proposal can be made.

*Proposal 2. The actual number of REs for PSSCH DMRS is used for PSSCH TBS determination.*

Please share your views if Proposal 2 is agreeable or, if not, please share your views on the reason why it is not workable. When sharing views, please share you views on FFS, if there is, to be discussed together.

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| **Company** | **Views** |
| NTT DCOOMO | Support.  For FFS part, actual number of REs should be subtracted. That is, PSCCH overlap should be considered for the subtraction. Otherwise, subtracted amount is not the actual number of REs for DM-RS. Motivation of Alt B-3 is lost in this case. |
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# **C. How to deal with the 2nd SCI overhead in determination of TBS for PSSCH?**

Based on the submitted contributions, there are the following alternatives and supporting companies.

* Alt C-1. Consider the actual number of REs occupied by the 2nd SCI (FFS: whether to use of averaged or reference beta offset for 2nd SCI, or use the exactly same number of Res occupied by the 2nd SCI)
  + [Huawei, HiSilicon], [OPPO], [CATT], [Ericsson], [NEC], [NTT DCM], [Qualcomm], [Apple], [Intel]
  + FFS: how to resolve chicken-and-egg problem with the number of coded symbols of the 2nd SCI
* Alt C-2. Consider the reference number of REs for occupied by the 2nd SCI
  + [Nokia, NSB]
* Alt C-3. Introduce higher layer parameter, e.g., *sl\_xOverhead*
  + [ZTE, Sanechips], [vivo], [LGE], [Spreadtrum]
* Alt C-4. Assume zero overhead
  + [Futurewei], [Panasonic]

Based on the contributions, the following proposal can be made.

*Proposal 3. The actual number of REs occupied by the 2nd SCI is used for PSSCH TBS determination.*

Please share your views if Proposal 3 is agreeable or, if not, please share your views on the reason why it is not workable. When sharing views, please share you views on FFS, if there is, to be discussed together.

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| **Company** | **Views** |
| NTT DOCOMO | Support with the following.  For FFS part, our preference to resolve the chicken-egg problem is to update rate-matching formula. The current formula uses TBS. If the formula is updated as independent to TBS like UCI on PUSCH without UL-SCH, the issue is resolved. We understand that this means reverting the previous agreement. If there is objection, we are OK to support Alt C-3.  In our memory, rate-matching formula like UCI on PUSCH without UL-SCH was closed to be supported, but the formula was updated before reaching agreements without sufficient analysis. Now we have problem, then we hope that reverting is agreeable.. |
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# **D. How to deal with SL CSI-RS and PT-RS in determination of TBS for PSSCH?**

Based on the submitted contributions, there are the following alternatives and supporting companies.

* Alt D-1. Introduce higher layer parameter, e.g., *sl\_xOverhead*
  + [Huawei, HiSilicon], [ZTE, Sanechips], [OPPO], [Nokia, NSB], [LGE], [Intel], [CATT], [Ericsson], [Spreadtrum], [NEC], [Qualcomm],
* Alt D-2. Assume always present
  + [Futurewei], [Mitsubishi] (only for CSI-RS)
* Alt D-3. Consider actual number of REs
  + [Futurewei] (only for PT-RS), [Apple], [Mitsubishi] (only for PT-RS)

Based on the contributions, the following proposal can be made.

*Proposal 4. Introduce and use the higher layer parameter sl\_xOverhead to handle the overhead due to SL CSI-RS and PT-RS PSSCH TBS determination.*

Please share your views if Proposal 4 is agreeable or, if not, please share your views on the reason why it is not workable. When sharing views, please share you views on FFS, if there is, to be discussed together.

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| **Company** | **Views** |
| NTT DOCOMO | Support (with adding ‘at least’ before SL CSI-RS since other overhead could be included as well, which is dependent on discussions for A/B/C.) |
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# **E. Whether and how to define/use high layer parameter *sl\_xOverhead* for determination of TBS for PSSCH?**

Based on the submitted contributions, there are the following alternatives and supporting companies.

* Alt E-1. Define *sl\_xOverhead* and (pre-)configure this parameter per resource pool
* Alt E-2. Define *sl\_xOverhead* and indicate this parameter by the 1st SCI
  + [LGE]
* Alt E-3. Not define *sl\_xOverhead*

Please share your views on this issue.

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| **Company** | **Views** |
| NTT DOCOMO | Alt E-1. |
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