3GPP TSG-RAN WG2 #110-e R2-20xxxxx

Electronic Meeting, 1st – 12th June 2020

Agenda Item: 6.0.3

Source: Ericsson

Title: [AT110-e][067][NR16] NR ASN1 3 (Ericsson)

Document for: Discussion, Decision

# 1 Introduction

This document is to kick off the following email discussion:

* [AT110-e][067][NR16] NR ASN1 3 (Ericsson)

 Scope: Default value I631 E252, Misc Need codes Conditions I630 I655 I662 I663 I665 I841

R2-2004732 Miscellaneous ASN.1 corrections related to I630, I631, I632, I633

 Deadline: Wed June 10 0500 UTC

# 2 Discussion

## 2.1 I631

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| I631 | Intel (Sudeep) | URLLC | [R2-2004732](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2004732.zip) | This kind of “default” value has been discouraged previously as it will not be possible to use Need M for values other than n1. Also implies that n1 is always configured, and cannot be released. Discussed further in the contribution. |

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| --- | --- | --- |
| [R2-2004732](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2004732.zip) | Miscellaneous ASN.1 corrections related to I630, I631, I632, I633 | Intel Corporation |

Proposal in R2-200732:

– InvalidSymbolPattern

 periodicityAndPattern-r16 CHOICE {

 n1 NULL,

 n2 BIT STRING (SIZE (2)),

 n4 BIT STRING (SIZE (4)),

 n5 BIT STRING (SIZE (5)),

 n8 BIT STRING (SIZE (8)),

 n10 BIT STRING (SIZE (10)),

 n20 BIT STRING (SIZE (20)),

 n40 BIT STRING (SIZE (40))

 } OPTIONAL, -- Need M (URLLC)

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| ***periodicityAndPattern***A time domain repetition pattern at which the pattern. This slot pattern repeats itself continuously. When the field is not configured, it indicates the value n1 (see TS 38.214 [19], clause 6.1). |

**I631.1 : Does companies agree to the TP above? If not, please provide alternative solution.**

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| Company | Comments |
| Intel | There are two points discussed in [R2-2004732](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2004732.zip) relative to this (this is also related to discussion in section 2.3):1. Whether to replace the text “Absence of this field” with “when the field is not configured”. Conceptually, with delta configuration and Need codes, we should really consider whether the field is configured rather than talk about presence/absence of a field. On just this aspect, we can use Need R to also ensure the field can be released. It doesn’t allow delta signalling though.
2. Additionally to point 1, to allow delta configuration, add the value/code point to indicate a “release” mechanism and use with Need M to minimise overhead from extension groups.

The above example was chosen to show the change needed for both these points. But it is also possible to just do point 1 as follows:periodicityAndPattern-r16 CHOICE { n2 BIT STRING (SIZE (2)), n4 BIT STRING (SIZE (4)), n5 BIT STRING (SIZE (5)), n8 BIT STRING (SIZE (8)), n10 BIT STRING (SIZE (10)), n20 BIT STRING (SIZE (20)), n40 BIT STRING (SIZE (40)) } OPTIONAL, -- Need R

|  |
| --- |
| ***periodicityAndPattern***A time domain repetition pattern at which the pattern. This slot pattern repeats itself continuously. When the field is not configured, it indicates the value n1 (see TS 38.214 [19], clause 6.1). |

In sumary, we think point 1 is simple to do and useful to done now. Point 2 may be too late to consider encoding optimisation now considering there are many Need R/S in extension groups and some of it may require confirmation from rAN1.  |
| Ericsson | Agree with intel. |
| MediaTek | We agree with Intel that point 1 is more needed. Thus we slightly prefer the proposed change from Intel. |
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## 2.2 E252

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| E252 | NR-U | 2 | The absence of intraCellGuardBandUL/DL sets up default guard bands. This will impact legacy UEs and UEs that do not support guard bands, see feature (10-19a [Support DL reception in a carrier with intra-cell guard-bands] and 10-19b [Support UL transmission with subset of RB sets passing LBT]) in RAN1 document (R1-2003073). A UE not supporting the feature will have to read the fields and determine that nrofCRBs = 0 to find out that no guard bands are configured. | Default configuration is signalled explicitly with e.g. a CHOICE indicating default NULL, and if absent, the feature is not used. |

ServingCellConfigCommon

 [[

 channelAccessMode-r16 CHOICE {

 dynamic NULL,

 semiStatic SemiStaticChannelAccessConfig

 } OPTIONAL, -- Need M

 discoveryBurstWindowLength-r16 ENUMERATED {ms0dot5, ms1, ms2, ms3, ms4, ms5} OPTIONAL, -- Need M

 ssb-PositionQCL-r16 SSB-PositionQCL-Relationship-r16 OPTIONAL, -- Cond SharedSpectrum

 intraCellGuardBandUL-r16 IntraCellGuardBand-r16 OPTIONAL, -- Need S

 intraCellGuardBandDL-r16 IntraCellGuardBand-r16 OPTIONAL, -- Need S

 highSpeedConfig-r16 HighSpeedConfig-r16 OPTIONAL -- Need R

 ]]

}

|  |
| --- |
| ***intraCellGuardBandDL, intraCellGuardBandUL***List of guard bands in a BWP. For each entry in the list, *startCRB* indicates the starting RB of the guard band and *nrofCRBs* indicates the length of the guard band in RBs. For *intraCellGuardBandUL,* when *nrofCRBs* is 0, zero-size or no guard band is used. If not configured, the guard bands are defined according the TS 38.101-X.  |

The Rapporteur’s understanding is that there is no issue with legacy UE with the current ASN.1 coding, as long as the guard bands are defined only for new Bands (un-licensed).

The Rapporteur also assumes Network does not know if UE (that supports a band with guard bands) supports only the default guard band setting (and not the signalled setting),

The Rapporteur also notes that with current signalling, it is not possible to indicate that no guard bands are used for a Band where there is a default guard band setting defined in the RAN4 spec. The Rapporteur assumes this is never needed.

**E252.1 : Does companies have a different view than expressed by the Rapporteur above? If so, a code point indicating “no guard band” should be introduced.**

|  |  |
| --- | --- |
| Company | Comments |
| Ericsson | A simple solution would be to introduce a Choice structhreintraCellGuardBandDL CHOICE default NULL,  signalled IntraCellGuardBand-r16 OPTIONAL |
| Intel2 | We understand this was discussed in the WI session and not agreed.However, we agree with the current specification text is not ideal. It comes from the extensive use of Need S with its issues that has been previously discussed. So in general, Intel supports removing default behaviours for absence and the Ericsson proposal. But this may not be agreeable based on WI discussion? |
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## 2.3 I630

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| I630 | MIMO | 2 | Use of Need R in an extension group will not allow delta signalling of this field and will hence incur the extension group header overhead when reconfonfiguring legacy or future fields. Use Need M to avoid extension grouping overhead. Discussion document provides more details. | Please refer to discussion document. For example, consider changing to ENUMERATED {enabled, disabled} with Need M |

|  |  |  |
| --- | --- | --- |
| [R2-2004732](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_110-e/Docs/R2-2004732.zip) | Miscellaneous ASN.1 corrections related to I630, I631, I632, I633 | Intel Corporation |

From R2-2004732:

Use of Need R in extension groups

There should be a release mechanism for Rel-16 fields as discussed previously and Need R is a convenient way to do so, at the expense of not allowing delta signalling. Rel-16 fields are most often in an extension group, and any change in another field value will require signalling these Need R fields again (to avoid them from being released) and incurring the overhead of the extension group square brackets.

The solutions are similar to the option 2 discussed above:

1. Introduce a code point to indicate release and use Need M
2. Group related fields and use SetupRelease structure

There are a few Need R in extension groups, and the identified ones are listed in Annex B. Some of them are in IEs where the other fields do not change very often and hence it is not essential to allow delta signalling.

**Proposal #3: Discuss whether to introduce delta signalling for the Need R fields in extension groups. If there is interest in doing so, continue discussion further by email to identify where it is useful and the solution.**

An extract of the fields that use Need R in extension groups is provided in Annex 4.2 below to understand the nature of changes.

**I630.1: Does companies consider that for any of the IEs/fields listed in Appendix A, there is a need to introduce possibility to use delta signalling? Please also indicate any additional missing cases with Need R fields in extension groups, where delta signalling should be considered.**

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| --- | --- |
| Company | Comments |
| Intel | It might be too late now to make such extensive changes to allow delta signalling. Please also refer to our comments to Q I631.1 in section 2.1. |
| Ericsson | Tend to agree, it is late |
| MediaTek | No strong view. Agree that it is too late to have this kind of extensive changes. |
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## 2.4 I655

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| I655 | DCCA | 2 | Cannot normally use conditional presence for setupRelease fields as the field must be present to release the configuration when the configuration is not valid. | Remove conditional presence and move the details to field description to indicate when the network should configure the UE with this field. | Ericsson (Oumer): The relevant field is now moved to reconfiguration, but the RIL still applies ther |

Same issue as H246 and covered by [AT110-e][066][NR16] NR ASN1 2

Need not be discussed here.

## 2.6 I662, I663 – SlotFormatIndicator

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| --- | --- | --- | --- | --- |
| I662 | NR-U | 2 | Doesn’t look like Need N. | Change to Need M/R based on how to release. |
| I663 | NR-U | 2 | Can’t be Need N as the fields of the IE CO-DurationPerCell-r16 are Need M. | Change to Need M/R based on how to release. |

Related is also H541-H544 (Class 3) and following tdoc, allocated to NR-U WI session

[R2-2004990](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004990.zip) [H541-544] Text proposal for SlotFormatIndicator Huawei, HiSilicon discussion Rel-16 NR\_unlic-Core Late

SlotFormatIndicator ::= SEQUENCE {

 sfi-RNTI RNTI-Value,

 dci-PayloadSize INTEGER (1..maxSFI-DCI-PayloadSize),

 slotFormatCombToAddModList SEQUENCE (SIZE(1..maxNrofAggregatedCellsPerCellGroup)) OF SlotFormatCombinationsPerCell

 OPTIONAL, -- Need N

 slotFormatCombToReleaseList SEQUENCE (SIZE(1..maxNrofAggregatedCellsPerCellGroup)) OF ServCellIndex OPTIONAL, -- Need N

 ...,

 [[

 availableRB-SetToAddModList-r16 SEQUENCE (SIZE(1..maxNrofAggregatedCellsPerCellGroup)) OF AvailableRB-SetsPerCell-r16 OPTIONAL, -- Need N

 availableRB-SetToRelease-r16 SEQUENCE (SIZE(1..maxNrofAggregatedCellsPerCellGroup)) OF ServCellIndex OPTIONAL, -- Need N

 searchSpaceSwitchTrigger-r16 SEQUENCE {

 positionInDCI INTEGER(0..maxSFI-DCI-PayloadSize-1),

 id CHOICE {

 servingCellId ServCellIndex,

 groupId INTEGER (0..1)

 }

 } OPTIONAL, -- Need N

 co-DurationPerCellList-r16 SEQUENCE (SIZE(1..maxNrofAggregatedCellsPerCellGroup)) OF CO-DurationPerCell-r16 OPTIONAL -- Need N

 ]]

}

Related is also H541-H544 (Class 3) and following tdoc, allocated to NR-U WI session

[R2-2004990](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_110-e%5CDocs%5CR2-2004990.zip) [H541-544] Text proposal for SlotFormatIndicator Huawei, HiSilicon discussion Rel-16 NR\_unlic-Core Late

Since TP in R2-2004990 completely overlaps with I662-I663, it is proposed to await outcome of WI NR-U session, and not discuss I662/I663 here.

## 2.7 I665 – SPS-Config

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| I665 | IIOT | 2 | Looks like stored configuration and hence can’t be Need N. | Change to M/R depending on how to release the field. Same for the other fields here. |

This RIL is related:

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| --- | --- | --- | --- | --- |
| I817 | IIOT | 2 | All these fields were changed to Need M but now there is no mechanism to release them. | use grouping with setupRelease and Need R for the subfields. |

SPS-Config ::= SEQUENCE {

 periodicity ENUMERATED {ms10, ms20, ms32, ms40, ms64, ms80, ms128, ms160, ms320, ms640,

 spare6, spare5, spare4, spare3, spare2, spare1},

 nrofHARQ-Processes INTEGER (1..8),

 n1PUCCH-AN PUCCH-ResourceId OPTIONAL, -- Need M

 mcs-Table ENUMERATED {qam64LowSE} OPTIONAL, -- Need S

 ...,

 [[

 sps-ConfigIndex-r16 SPS-ConfigIndex-r16 OPTIONAL, -- Need N

 harq-ProcID-Offset-r16 INTEGER (0..15) OPTIONAL, -- Need M

 periodicityExt-r16 INTEGER (1..5120) OPTIONAL, -- Need M

 harq-CodebookID-r16 INTEGER (1..2) OPTIONAL, -- Need M

 pdsch-AggregationFactor-r16 ENUMERATED {n1, n2, n4, n8 } OPTIONAL -- Need S

 ]]

}

|  |
| --- |
| *SPS-Config* field descriptions |
| ***harq-CodebookID***Indicates the HARQ-ACK codebook index for the corresponding HARQ-ACK codebook for SPS PDSCH and ACK for SPS PDSCH release. |
| ***harq-ProcID-Offset***Indicates the offset used in deriving the HARQ process IDs, see TS 38.321 [3], clause 5.3.1. |
| ***mcs-Table***Indicates the MCS table the UE shall use for DL SPS (see TS 38.214 [19],clause 5.1.3.1. If present, the UE shall use the MCS table of low-SE 64QAM table indicated in Table 5.1.3.1-3 of TS 38.214 [19]. If this field is absent and field mcs-table in PDSCH-Config is set to 'qam256' and the activating DCI is of format 1\_1, the UE applies the 256QAM table indicated in Table 5.1.3.1-2 of TS 38.214 [19]. Otherwise, the UE applies the non-low-SE 64QAM table indicated in Table 5.1.3.1-1 of TS 38.214 [19]. |
| ***n1PUCCH-AN***HARQ resource for PUCCH for DL SPS. The network configures the resource either as format0 or format1. The actual *PUCCH-Resource* is configured in *PUCCH-Config* and referred to by its ID. See TS 38.213 [13], clause 9.2.3. |
| ***nrofHARQ-Processes***Number of configured HARQ processes for SPS DL (see TS 38.321 [3], clause 5.8.1). |
| ***pdsch-AggregationFactor***Number of repetitions for SPS PDSCH (see TS 38.214 [19], clause 5.1.2.1). When the field is absent, the UE applies PDSCH aggregation factor signalled in PDSCH-Config. |
| ***periodicity***Periodicity for DL SPS (see TS 38.214 [19] and TS 38.321 [3], clause 5.8.1). |
| ***periodicityExt***This field is used to calculate the periodicity for DL SPS (see TS 38.214 [19] and see TS 38.321 [3], clause 5,8.1). If this field is present, the field *periodicity* is ignored.The following periodicities are supported depending on the configured subcarrier spacing [slots]:15 kHz: *periodicityExt*, where *periodicityExt* has a value between 1 and 640.30 kHz: *periodicityExt*, where *periodicityExt* has a value between 1 and 1280.60 kHz with normal CP: *periodicityExt*, where *periodicityExt* has a value between 1 and 2560.60 kHz with ECP: *periodicityExt*, where *periodicityExt* has a value between 1 and 2560.120 kHz: *periodicityExt*, where *periodicityExt* has a value between 1 and 5120. |
| ***sps-ConfigIndex***Indicates the index of one of multiple SPS configurations. |

Rapporteur proposes the following w r t Z139, I665 and I817:

1. Confirm earlier conclusion to add Conditinal Presence for sps-ConfigIndex-r16 (e.g. ”The field is mandatory present in case SPS-config is included in SPS-ConfigMulti”).
2. Use grouping with SetupRelease structure and Need R for the subfields.
3. The above proposals 1) and 2) need to be aligned with other potential changes/agreements on SPS-Config/SPS-ConfigMulti (WI IioT).

**I665.1 : Does companies agree to the proposal above? If not, please provide alternative solution.**

|  |  |
| --- | --- |
| Company | Comments |
| Intel | Commenting only on proposal 2 at this time, please note that Need codes for this IE is also discussed in offline 066.  |
| Ericsson | There was a strong dis-like of the wording „multi“ in the IIoT session. The IIoT WI has agreed to move the list to BWPDownlinkDedicated. It is now straightfoward that the sps-ConfigIndex-r16 has to be present when configuring with the list. The second change can be concluded in the offline 066. Using need R for each field is also okay.  |
| MediaTek | If the change to Need R as proposed in offline 066 is agreed, no further grouping is required as there is no value added by such a grouping. If not agreed (i.e. they are Need M), then an introduction of a SetupRelease structure would make sense. |
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## 2.8 I841

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| --- | --- | --- | --- | --- | --- |
| I841 | URLLC | 2 | Need code is not required here, even for absence. The IE is part of a list that is not an addNMod list – hence the entire list is replaced. | Remove “Need M” |   |

#### – *UplinkCancellation*

The IE *UplinkCancellation* is used to configure the UE to monitor PDCCH for the CI-RNTI.

*UplinkCancellation* information element

-- ASN1START

-- TAG-UPLINKCANCELLATION-START

UplinkCancellation-r16 ::= SEQUENCE {

 ci-RNTI-r16 RNTI-Value,

 dci-PayloadSizeForCI-r16 INTEGER (0..maxCI-DCI-PayloadSize-r16),

 ci-ConfigurationPerServingCell-r16 SEQUENCE (SIZE (1..maxNrofServingCells)) OF CI-ConfigurationPerServingCell-r16,

 ...

}

CI-ConfigurationPerServingCell-r16 ::= SEQUENCE {

 servingCellId ServCellIndex,

 positionInDCI-r16 INTEGER (0..maxCI-DCI-PayloadSize-r16-1),

 positionInDCI-ForSUL-r16 INTEGER (0..maxCI-DCI-PayloadSize-r16-1) OPTIONAL, -- Cond SUL-Only

 ci-PayloadSize-r16 ENUMERATED {n1, n2, n4, n5, n7, n8, n10, n14, n16, n20, n28, n32, n35, n42, n56, n112},

 timeFrequencyRegion-r16 SEQUENCE {

 timeDurationForCI-r16 ENUMERATED {n2, n4, n7, n14} OPTIONAL, -- Cond SymbolPeriodicity

 timeGranularityForCI-r16 ENUMERATED {n1, n2, n4, n7, n14, n28},

 frequencyRegionForCI-r16 INTEGER (0..37949),

 deltaOffset-r16 INTEGER (0..2),

 ...

 }

}

-- TAG-UPLINKCANCELLATION-STOP

-- ASN1STOP

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *SUL-Only* | The field is optionally present, Need R, if this serving cell is configured with a supplementary uplink (SUL). It is absent otherwise. |
| *SymbolPeriodicity* | This field is mandatory present if the configured UL CI monitoring periodicity is less than 1 slot with only one monitoring occasion, Need M, otherwise absent. |

**I841.1 : Does companies agree delete “Need M” from the Explanation, as proposed above ? If not, please provide alternative solution.**

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| --- | --- |
| Company | Comments |
| Intel | Agree (proponent) |
| Ericson | Agree |
| MediaTek | Agree |
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# Conclusion

In the previous sections we made the following observations:

Based on the discussion in the previous sections we propose the following:

# Appendix A

List of fields that use Need R in extension groups

#### – DMRS-UplinkConfig

 dmrs-Uplink-r16 ENUMERATED {enabled} OPTIONAL -- Need R

#### – LogicalChannelConfig

 channelAccessPriority-r16 INTEGER (1..4) OPTIONAL, -- Need R

 bitRateMultiplier-r16 ENUMERATED {x40, x70, x100, x200} OPTIONAL -- Need R

#### – MAC-CellGroupConfig

 lch-BasedPrioritization-r16 ENUMERATED {enabled} OPTIONAL, -- Need R

 schedulingRequestID-BFR-SCell-r16 SchedulingRequestId OPTIONAL -- Need R

#### – MeasObjectNR

 smtc3list-v16xy SSB-MTC3List-v16xy OPTIONAL, -- Need R

#### – PDCCH-Config

 searchSpaceSwitchingTimer-r16 INTEGER (1..80) OPTIONAL, -- Need R

 searchSpaceSwitchingGroupList-r16 SEQUENCE(SIZE (1..ffsValue)) OF SearchSpaceSwitchingGroup-r16 OPTIONAL, -- Need R

#### – PDSCH-Config

 dataScramblingIdentityPDSCH2-r16 INTEGER (0..1023) OPTIONAL, -- Need R

#### – PhysicalCellGroupConfig

 ackNackFeedbackMode-r16 ENUMERATED {joint, separate} OPTIONAL, -- Need R

 bdFactorR-r16 ENUMERATED {n1} OPTIONAL -- Need R

#### – PTRS-DownlinkConfig

 maxNrofPorts-r16 ENUMERATED {n1, n2} OPTIONAL -- Need R

#### – RACH-ConfigGeneric

 ra-ResponseWindow-r16 ENUMERATED {sl1, sl2, sl4, sl8, sl10, sl20, sl40, sl60, sl80, sl160} OPTIONAL, -- Need R

 prach-ConfigurationIndex-v16xy INTEGER (256..262) OPTIONAL, -- Need R

 prach-ConfigurationPeriodScaling-IAB-r16 ENUMERATED {scf1,scf2,scf4,scf8,scf16,scf32,scf64} OPTIONAL, -- Need R

 prach-ConfigurationFrameOffset-IAB-r16 INTEGER (0..63) OPTIONAL, -- Need R

 prach-ConfigurationSOffset-IAB-r16 INTEGER (0..39) OPTIONAL -- Need R

#### – RateMatchPattern

 controlResourceSet-r16 ControlResourceSetId-r16 OPTIONAL -- Need R

#### – ReportConfigNR

 reportSFTD-NeighMeas ENUMERATED {true} OPTIONAL, -- Need R

 drx-SFTD-NeighMeas ENUMERATED {true} OPTIONAL, -- Need R

 cellsForWhichToReportSFTD SEQUENCE (SIZE (1..maxCellSFTD)) OF PhysCellId OPTIONAL -- Need R

PeriodicalReportConfig ::=

 measRSSI-ReportConfig-r16 MeasRSSI-ReportConfig-r16 OPTIONAL, -- Need R

 includeCommonLocationInfo-r16 ENUMERATED {true} OPTIONAL, -- Need R

EventTriggerConfig::= SEQUENCE {

 measRSSI-ReportConfig-r16 MeasRSSI-ReportConfig-r16 OPTIONAL, -- Need R

 includeCommonLocationInfo-r16 ENUMERATED {true} OPTIONAL, -- Need R

#### – ServingCellConfig

ServingCellConfig ::=

 uplinkConfig UplinkConfig OPTIONAL, -- Need M

UplinkConfig ::=

 enablePLRS-UpdateForPUSCH-SRS ENUMERATED {enabled} OPTIONAL, -- Need R

 enableDefaultBeamPL-ForPUSCH0 ENUMERATED {enabled} OPTIONAL, -- Need R

 enableDefaultBeamPL-ForPUCCH ENUMERATED {enabled} OPTIONAL, -- Need R

 enableDefaultBeamPL-ForSRS ENUMERATED {enabled} OPTIONAL -- Need R

# References

[1]