**3GPP TSG-RAN WG2 Meeting #109 electronic R2-200xxxx**

**Elbonia, 24 Feb – 6 Mar 2020**

**Agenda item: 6.8.1**

**Source: Intel Corporation**

**Title: Report of [AT109e][601][POS] Harmonise posSIB numbering across CRs (Intel)**

**Document for: Discussion and Decision**

# Introduction

This is the email discussion report on below email discussion:

* [AT109e][601][POS] Harmonise posSIB numbering across CRs (Intel)

**Status:** Started

      **Scope:** Align posSIB numbering between the following CRs:

* R2-2001333 (38.331 running CR)
* R2-2001216 (36.331 CR to introduce PPP-RTK)
* R2-2001255 (38.331 CR to introduce on-demand SI request in connected mode)
* R2-2001230 (37.355 CR to introduce PPP-RTK)
* R2-2001234 (TPs to 37.355 to introduce UE-based DL positioning)
* R2-2000006 (37.355 CR to introduce barometric pressure broadcast)
* R2-2000188 (36.331 CR to introduce barometric pressure broadcast)
* R2-2000396 (36.331 CR to introduce TBS AD broadcast)
* R2-2000426 (37.355 CR to introduce TBS AD broadcast)
* R2-2000153 (37.355 CR to introduce NavIC)
* R2-2000157 (36.331 CR to introduce NavIC)

**Intended Outcome:** Agreed document listing the posSIB numbers, for reference by individual CR authors

**Deadline: Thursday** 2020-02-27 1200 CET

# Discussion

The posSIB number is defined in section 7.2 in LPP specification TS36.355 or TS37.355 as below, and to be used in RRC specification.

The supported *posSibType*'s are specified in Table 7.2-1. The GNSS Common and Generic Assistance Data IEs are defined in sub-clause 6.5.2.2. The OTDOA Assistance Data IEs are defined in sub-clause 7.4.2.

Table 7.2-1: Mapping of posSibType to assistanceDataElement

|  |  |  |
| --- | --- | --- |
|  | *posSibType* [12] | *assistanceDataElement* |
| GNSS Common Assistance Data (clause 6.5.2.2) | *posSibType1-1* | *GNSS-ReferenceTime* |
| *posSibType1-2* | *GNSS-ReferenceLocation* |
| *posSibType1-3* | *GNSS-IonosphericModel* |
| *posSibType1-4* | *GNSS-EarthOrientationParameters* |
| *posSibType1-5* | *GNSS-RTK-ReferenceStationInfo* |
| *posSibType1-6* | *GNSS-RTK-CommonObservationInfo* |
| *posSibType1-7* | *GNSS-RTK-AuxiliaryStationData* |
| GNSS Generic Assistance Data (clause 6.5.2.2) | *posSibType2-1* | *GNSS-TimeModelList* |
| *posSibType2-2* | *GNSS-DifferentialCorrections* |
| *posSibType2-3* | *GNSS-NavigationModel* |
| *posSibType2-4* | *GNSS-RealTimeIntegrity* |
| *posSibType2-5* | *GNSS-DataBitAssistance* |
| *posSibType2-6* | *GNSS-AcquisitionAssistance* |
| *posSibType2-7* | *GNSS-Almanac* |
| *posSibType2-8* | *GNSS-UTC-Model* |
| *posSibType2-9* | *GNSS-AuxiliaryInformation* |
| *posSibType2-10* | *BDS-DifferentialCorrections* |
| *posSibType2-11* | *BDS-GridModelParameter* |
| *posSibType2-12* | *GNSS-RTK-Observations* |
| *posSibType2-13* | *GLO-RTK-BiasInformation* |
| *posSibType2-14* | *GNSS-RTK-MAC-CorrectionDifferences* |
| *posSibType2-15* | *GNSS-RTK-Residuals* |
| *posSibType2-16* | *GNSS-RTK-FKP-Gradients* |
| *posSibType2-17* | *GNSS-SSR-OrbitCorrections* |
| *posSibType2-18* | *GNSS-SSR-ClockCorrections* |
| *posSibType2-19* | *GNSS-SSR-CodeBias* |
| OTDOA Assistance Data (clause 7.4.2) | *posSibType3-1* | *OTDOA-UE-Assisted* |

The new posSIBs introduced in Rel-16 are:

LTE:

* Barometric pressure R2-2000006 [6]:

|  |  |  |
| --- | --- | --- |
| Barometric Assistance Data(clause 6.5.5.8) | *posSibTypeX-Y* | *Sensor-AssistanceDataList* |

* TBS AD in R2-2000426 [9];

|  |  |  |
| --- | --- | --- |
| TBS Assistance Data(clause 7.4.2) | *posSibTypeX-Y* | *TBS-AssistanceDataList* |

* NavIC R2-2000153 [10];

|  |  |  |
| --- | --- | --- |
| GNSS Generic Assistance Data (clause 6.5.2.2) | *posSibType2-xx* | *NavIC-DifferentialCorrections* |
| *posSibType2-yy* | *NavIC-GridModelParameter* |

NR/LTE:

* PPP-RTK R2-2001230 [4];

|  |  |  |
| --- | --- | --- |
|  | *posSibType* [12] | *assistanceDataElement* |
| GNSS Common Assistance Data (clause 6.5.2.2) | *posSibType1-8* | *GNSS-SSR-CorrectionPoints* |
| GNSS Generic Assistance Data (clause 6.5.2.2) | *posSibType2-20* | *GNSS-SSR-URA* |
| *posSibType2-21* | *GNSS-SSR-PhaseBias* |
| *posSibType2-22* | *GNSS-SSR-STEC-Correction* |
| *posSibType2-23* | *GNSS-SSR-GriddedCorrection* |

NR:

posSIB related agreements are

Agreements:

The mapping table 7.2-1 defined in TS36.355 is reused for A-GNSS, RTK, and LTE OTDOA

Introduce new posSibType(s) for PPP-RTK

Introduce new posSibType(s) for NR DL TDOA

* UE based DL positioning R2-2001234 [5], aligned with agreement “Split the position calculation assistance data into two separate posSIBs, one containing the TRP coordinates and one containing the RTDs.”;

'*posSibTypeX-y*' *NR-UEB-TRP-LocationData*

'*posSibTypeX-z*'. *NR-UEB-TRP-RTD-Info*

So far, the necessary posSIBs for PPP-RTK, NavIC, TBS aD and barometric pressure are quite stable. We should do the numbering for them first.

The example could be:

Table 7.2-1: Mapping of posSibType to assistanceDataElement

|  |  |  |
| --- | --- | --- |
|  | *posSibType* [12] | *assistanceDataElement* |
| GNSS Common Assistance Data (clause 6.5.2.2) | *posSibType1-1* | *GNSS-ReferenceTime* |
| *posSibType1-2* | *GNSS-ReferenceLocation* |
| *posSibType1-3* | *GNSS-IonosphericModel* |
| *posSibType1-4* | *GNSS-EarthOrientationParameters* |
| *posSibType1-5* | *GNSS-RTK-ReferenceStationInfo* |
| *posSibType1-6* | *GNSS-RTK-CommonObservationInfo* |
| *posSibType1-7* | *GNSS-RTK-AuxiliaryStationData* |
| *posSibType1-8* | *GNSS-SSR-CorrectionPoints* |
| GNSS Generic Assistance Data (clause 6.5.2.2) | *posSibType2-1* | *GNSS-TimeModelList* |
| *posSibType2-2* | *GNSS-DifferentialCorrections* |
| *posSibType2-3* | *GNSS-NavigationModel* |
| *posSibType2-4* | *GNSS-RealTimeIntegrity* |
| *posSibType2-5* | *GNSS-DataBitAssistance* |
| *posSibType2-6* | *GNSS-AcquisitionAssistance* |
| *posSibType2-7* | *GNSS-Almanac* |
| *posSibType2-8* | *GNSS-UTC-Model* |
| *posSibType2-9* | *GNSS-AuxiliaryInformation* |
| *posSibType2-10* | *BDS-DifferentialCorrections* |
| *posSibType2-11* | *BDS-GridModelParameter* |
| *posSibType2-12* | *GNSS-RTK-Observations* |
| *posSibType2-13* | *GLO-RTK-BiasInformation* |
| *posSibType2-14* | *GNSS-RTK-MAC-CorrectionDifferences* |
| *posSibType2-15* | *GNSS-RTK-Residuals* |
| *posSibType2-16* | *GNSS-RTK-FKP-Gradients* |
| *posSibType2-17* | *GNSS-SSR-OrbitCorrections* |
| *posSibType2-18* | *GNSS-SSR-ClockCorrections* |
| *posSibType2-19* | *GNSS-SSR-CodeBias* |
| *posSibType2-20* | *NavIC-DifferentialCorrections* |
| *posSibType2-21* | *NavIC-GridModelParameter* |
| *posSibType2-22* | *GNSS-SSR-URA* |
| *posSibType2-23* | *GNSS-SSR-PhaseBias* |
| *posSibType2-24* | *GNSS-SSR-STEC-Correction* |
| *posSibType2-25* | *GNSS-SSR-GriddedCorrection* |
| OTDOA Assistance Data (clause 7.4.2) | *posSibType3-1* | *OTDOA-UE-Assisted* |
| Barometric Assistance Data(clause 6.5.5.8) | *posSibType4-1* | *Sensor-AssistanceDataList* |
| TBS Assistance Data(clause 7.4.2) | *posSibType5-1* | *TBS-AssistanceDataList* |
|  |  |  |

**Question 1: Do companies agree the above number allocation for TBS AD, barometric pressure, NavIC and PPP-RTK?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Remark**  |
|  |  |  |
|  |  |  |
|  |  |  |

For NR posSIB, the agreement should be updated a bit to “Introduce new posSibType(s) for NR DL TDOA and DL AoD” since we have agreed that UE based positioning can be applied for DL-TDOA and DL AoD.

**Question 2: Do companies agree the new posSIB should be applied for both NR DL TDOA and DL AoD?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Remark**  |
|  |  |  |
|  |  |  |
|  |  |  |

We assume same as OTDOA, a new posSIB is sufficient for NR DL TDOA and NR DL AoD since the assistance data for them are same, except referencing cell. Then it will be:

|  |  |  |
| --- | --- | --- |
| NR DL Assistance Data (clause 7.4.2) | *posSibType6-1* | *NR-DL-UE-Assisted* |

**Question 3: Do companies agree the a new posSIB posSibType6-1 is introduced for both DL TDOA and DL AoD?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Remark**  |
|  |  |  |
|  |  |  |
|  |  |  |

The posSIB for UE based positioning can be introduced under NR DL Asssitance data, i.e.

|  |  |  |
| --- | --- | --- |
| NR DL Assistance Data (clause 7.4.2) | *posSibType6-1* | *NR-DL-UE-Assisted* |
| *posSibType6-2* | *NR-UEB-TRP-LocationData* |
| *posSibType6-3* | *NR-UEB-TRP-RTD-Info* |

**Question 4: Do companies agree posSibType6-2 and posSibType6-3 for NR-UEB-TRP-LocationData and NR-UEB-TRP-RTD-Info?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Remark**  |
|  |  |  |
|  |  |  |
|  |  |  |

Since so far, the posSIB for LTE and NR are specified in the same table, it would be good to add columns to show whether a posSIB is applied for LTE and/or NR.

The example is shown as below:

Table 7.2-1: Mapping of posSibType to assistanceDataElement

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | *posSibType* [12] | *assistanceDataElement* | *LTE* | *NR* |
| GNSS Common Assistance Data (clause 6.5.2.2) | *posSibType1-1* | *GNSS-ReferenceTime* | *Yes* | *Yes* |
| *posSibType1-2* | *GNSS-ReferenceLocation* | *Yes* | *Yes* |
| *posSibType1-3* | *GNSS-IonosphericModel* | *Yes* | *Yes* |
| *posSibType1-4* | *GNSS-EarthOrientationParameters* | *Yes* | *Yes* |
| *posSibType1-5* | *GNSS-RTK-ReferenceStationInfo* | *Yes* | *Yes* |
| *posSibType1-6* | *GNSS-RTK-CommonObservationInfo* | *Yes* | *Yes* |
| *posSibType1-7* | *GNSS-RTK-AuxiliaryStationData* | *Yes* | *Yes* |
| *posSibType1-8* | *GNSS-SSR-CorrectionPoints* | *Yes* | *Yes* |
| GNSS Generic Assistance Data (clause 6.5.2.2) | *posSibType2-1* | *GNSS-TimeModelList* | *Yes* | *Yes* |
| *posSibType2-2* | *GNSS-DifferentialCorrections* | *Yes* | *Yes* |
| *posSibType2-3* | *GNSS-NavigationModel* | *Yes* | *Yes* |
| *posSibType2-4* | *GNSS-RealTimeIntegrity* | *Yes* | *Yes* |
| *posSibType2-5* | *GNSS-DataBitAssistance* | *Yes* | *Yes* |
| *posSibType2-6* | *GNSS-AcquisitionAssistance* | *Yes* | *Yes* |
| *posSibType2-7* | *GNSS-Almanac* | *Yes* | *Yes* |
| *posSibType2-8* | *GNSS-UTC-Model* | *Yes* | *Yes* |
| *posSibType2-9* | *GNSS-AuxiliaryInformation* | *Yes* | *Yes* |
| *posSibType2-10* | *BDS-DifferentialCorrections* | *Yes* | *Yes* |
| *posSibType2-11* | *BDS-GridModelParameter* | *Yes* | *Yes* |
| *posSibType2-12* | *GNSS-RTK-Observations* | *Yes* | *Yes* |
| *posSibType2-13* | *GLO-RTK-BiasInformation* | *Yes* | *Yes* |
| *posSibType2-14* | *GNSS-RTK-MAC-CorrectionDifferences* | *Yes* | *Yes* |
| *posSibType2-15* | *GNSS-RTK-Residuals* | *Yes* | *Yes* |
| *posSibType2-16* | *GNSS-RTK-FKP-Gradients* | *Yes* | *Yes* |
| *posSibType2-17* | *GNSS-SSR-OrbitCorrections* | *Yes* | *Yes* |
| *posSibType2-18* | *GNSS-SSR-ClockCorrections* | *Yes* | *Yes* |
| *posSibType2-19* | *GNSS-SSR-CodeBias* | *Yes* | *Yes* |
| *posSibType2-20* | *NavIC-DifferentialCorrections* | *Yes* | *No* |
| *posSibType2-21* | *NavIC-GridModelParameter* | *Yes* | *No* |
| *posSibType2-22* | *GNSS-SSR-URA* | *Yes* | *Yes* |
| *posSibType2-23* | *GNSS-SSR-PhaseBias* | *Yes* | *Yes* |
| *posSibType2-24* | *GNSS-SSR-STEC-Correction* | *Yes* | *Yes* |
| *posSibType2-25* | *GNSS-SSR-GriddedCorrection* | *Yes* | *Yes* |
| OTDOA Assistance Data (clause 7.4.2) | *posSibType3-1* | *OTDOA-UE-Assisted* | *Yes* | *No* |
| Barometric Assistance Data(clause 6.5.5.8) | *posSibType4-1* | *Sensor-AssistanceDataList* | *Yes* | *No* |
| TBS Assistance Data(clause 7.4.2) | *posSibType5-1* | *TBS-AssistanceDataList* | *Yes* | *No* |
| NR DL Assistance Data (clause 7.4.2) | *posSibType6-1* | *NR-DL-UE-Assisted* | *No* | *Yes* |
| *posSibType6-2* | *NR-UEB-TRP-LocationData* | *No* | *Yes* |
| *posSibType6-3* | *NR-UEB-TRP-RTD-Info* | *No* | *Yes* |

**Question 5: Do companies agree to introduce columns on whether the posSIBs are applied for LTE and/or NR?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Remark**  |
|  |  |  |
|  |  |  |
|  |  |  |

**Question 6: If answer to 5 is yes, Do companies agree to the table shown as above on LTE/NR column?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Remark**  |
|  |  |  |
|  |  |  |
|  |  |  |

This is placeholder. Companies are invited to add if anything is missing in above discussion.

**Question 7: Is anything missing?**

|  |  |
| --- | --- |
| **Company** | **Remark**  |
|  |  |
|  |  |
|  |  |

# Conclusion

The followings are proposed:

# References

[1] R2-2001333 (38.331 running CR)

[2] R2-2001216 (36.331 CR to introduce PPP-RTK)

[3] R2-2001255 (38.331 CR to introduce on-demand SI request in connected mode)

[4] R2-2001230 (37.355 CR to introduce PPP-RTK)

[5] R2-2001234 (TPs to 37.355 to introduce UE-based DL positioning)

[6] R2-2000006 (37.355 CR to introduce barometric pressure broadcast)

[7] R2-2000188 (36.331 CR to introduce barometric pressure broadcast)

[8] R2-2000396 (36.331 CR to introduce TBS AD broadcast)

[9] R2-2000426 (37.355 CR to introduce TBS AD broadcast)

[10] R2-2000153 (37.355 CR to introduce NavIC)

[11] R2-2000157 (36.331 CR to introduce NavIC)