**3GPP TSG RAN WG2 Meeting #116-e R2-21xxxxx**

**Electronic meeting, 1th November - 12th November 2021**

**Source: ESA**

**Title: Email discussion on LS to RTCM for GNSS integrity**

**Agenda Item: 8.11.5**

**Document for: Discussion and Decision**

1. Introduction

During the email discussion on assistance data it was mentioned the need to continue interaction with RTCM and clarify any remaining open points on GNSS integrity.

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| * **[AT116-e][611][POS] LS to RTCM (ESA)**

      Scope: Discuss coordination with RTCM, taking into account the way-forward proposals in R[2-2109807](file:///E%3A%5CWORK%5C1%203GPP%5CMeeting%5CRAN2%20116-e%5C2%20During%5CDocs%5CR2-2109807.zip) and related parts of R[2-2110181](file:///E%3A%5CWORK%5C1%203GPP%5CMeeting%5CRAN2%20116-e%5C2%20During%5CDocs%5CR2-2110181.zip):* Conclude on the intention to specify GNSS integrity signalling in Rel-17
* Determine what information we intend to share with RTCM
* Draft an LS reply (TP to be endorsed later)

      Intended outcome: Report in R2-2111361 and approvable LS in R2-2111362      Deadline:  Friday 2021-11-05 1000 UTC (comments), Monday 2021-11-08 1100 UTC (output available) |

This contribution puts forward several considerations for a potential LS to RTCM.

1. Context

A reply LS from RTCM has been sent to RAN2 and its summary is included in R[2-2109807](file:///E%3A%5CWORK%5C1%203GPP%5CMeeting%5CRAN2%20116-e%5C2%20During%5CDocs%5CR2-2109807.zip). In a nutshell the information received could help clarify the scope and timeline used by RTCM SC134 for its work on GNSS integrity but not how exchange of information with RAN2 could be put in place.

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| Q 1: Do RAN2 delegates agree to include the first paragraph proposed in the tentative draft LS? This is to address some questions received from RTCM SC134. |
| Company | Agree/Disagree | Comments if any |
| ESA | Yes |  |
| CATT | Agree with comments | We prefer to give the answers to the comments directlyComment #1: are the presented use cases (Automotive, Rail, Industrial IoT) the only ones addressed by the Work Item?A: Yes, we confirm that automotive, rail, and industrial IoT are the only use cases addressed in Release 17 of Positioning integrity and reliability.Comment #2: It could be useful to know if the scope of the 3GPP Work-Item is intended to cover integrity of A-GNSS techniques (GNSS navigation message and SBAS message rebroadcasting) and SSR technologies (e.g. PPP, PPP-AR and PPP-RTK) only, or if other HA approaches and technique are part of the analysis.A: The scope of GNSS integrity work in 3GPP now covers integrity of A-GNSS techniques (GNSS navigation message and SBAS message rebroadcasting) and SSR technologies (e.g. PPP, PPP-AR and PPP-RTK) only.Comment #3: It is important to know how the 5G PRS and GNSS integration will be explicitly taken into account within TR 38.857 for indoor and harsh environment navigation solution.A: For Release 17 of 3GPP it was decided to focus only on GNSS integrity therefore 5G PRS and GNSS integration is not in scope of current release. 3GPP will consider the left requirement e.g. 5G PRS in the future release.  |
| ZTE | Yes | Support CATT for better reviewing |
| Nokia | Yes | We prefer CATT’s revision |
| Swift Navigation | Yes | Also prefer CATT’s revision |
| Intel | Yes,  | CATT ‘s version is also ok.  |
| Huawei, Hisilicon | Agree with comments | We are generally fine with the content, and the clarification made by CATT. Regarding CATT’s Comment #3, we don’t think it’s necessary to include the last sentence in the reply LS since there’s no formal agreement for now on the scope of the future release. |

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| Q 2: Do RAN2 delegates agree that we include in the LS a proposal for a 1 day online informal workshop with RTCM SC134 ?  |
| Company | Agree/Disagree | Comments if any |
| ESA | Yes | In absence of a integrity standard from RTCM (which is expected to become available only after the end of our WI), a full day workshop could allow us to better understand the direction RTCM SC134 is going towards. Also, it can help us decide if it´s best to keep GNSS integrity in Rel17 as simple as possible and defer more complex features for Release 18 when the RTCM integrity standard is supposed to be available. Lastly, Such an event would allow us to ask questions and receive answers in real-time. |
| CATT | No | If there is no consensus reached in RTCM SC134, it is hard and difficult to expect a joint meeting can reach any agreements or achieve a good progress. Furthermore, a full day online meeting would not be effective and it would be difficult to arrange such a long time web-meeting considering the variant time difference. So liaisons are workable in this case. If RTCM SC134 could speed up their work, they can provide their outcome ASAP to 3GPP via liaisons. |
| ZTE | Maybe  | Since the timeline of RTCM and RAN2 are not matched, a workshop may be useful to push the progress |
| Nokia | No | First of all, we need to clarify what is the purpose/target of this workshop? In general we think it would be an unnecessary burden for both RTCM and 3GPP. We do not see why we need to rush and address this in Rel-17, especially considering that RAN2 is already quite overloaded and busy with many other works. There is no big issue even if we need to wait until mid-2022 when RTCM’s draft specification becomes available. |
| Swift Navigation | No | Agree with CATT and Nokia. This would be logistically challenging and it’s unclear on the purpose and outcome of such a workshop.  |
| Intel |  | Same comments as CATT and Nokia. It is unclear the purpose of the workshop, and what is the expected outcome from 3GPP perspective, e.g. should we decide whether to postpone Integrity after the workshop with RTCM? In addition how to find the suitable time for both RAN2 and RTCM?To our understanding, we should decide in RAN2 on how to handle Integrity instead of waiting further inputs from RTCM. |
| Huawei, Hisilicon | Yes  | We believe an online informal workshop would be helpful for RAN2 to make solid progress on GNSS integrity. For example, in the email discussion ([Post115-e][607][POS] Integrity assistance data, a lot of technical details are involved, and it’s difficult for 3GPP RAN2 alone to make professional decisions.Additionally, it can also provide some insights for the potential discussion on Rel-18 RAT-dependent integrity. |
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Depending whether we will have a workshop some specific questions may need to be included in the LS

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| Q 3: Do RAN2 delegates agree that we include in LS question on overbounding errors: mean + sigma vs sigma only? |
| Company | Agree/Disagree | Comments if any |
| ESA | Yes but only if RAN2 decides not to have a workshop with RTCM SC134 | We could understand what is the approach in RTCM. |
| CATT | Agree | We prefer to include the basic overbounding errors only. |
| ZTE | Agree |  |
| Nokia | Agree |  |
| Swift Navigation | Agree |  |
| Intel | Agree | But Should not we include all related things (agreements, potential agreements, candidate solutions, parameters) in the LS? |
| Huawei, Hisilicon | Agree | It would be helpful for RAN2 to refer to RTCM’s expertise on this question. |

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| Q 4: Do RAN2 delegates agree to ask RTCM SC134 to invite us to attend its next meeting so we build at RAN2 level an understanding about the working process and scope of this RTCM Special Committee?  |
| Company | Agree/Disagree | Comments if any |
| ESA | Yes |  |
| CATT |  | If LS is workable, we don’t need to attend their meeting. Hopefully we will receive the LSs about their agreements and progress in time. If the progress of RTCM can’t meet the timeline of Rel-17, RAN2 may support basic integrity of GNSS and try to align with RTCM in Rel-18. |
| ZTE | Disagree | It is not necessary since RAN2 only cares about part of research overlapped with RTCM. No need to attend their meeting. If real-time communication is needed, a workshop will be enough |
| Nokia | Disagree | Similar to our comments in Q2, we do not see why we need to rush and increase our burdens unnecessarily. |
| Swift Navigation | Disagree | We don’t see that much would be gained by RAN2 sitting in on one meeting. Furthermore, the next RTCM SC134 meeting is currently scheduled for after the next RAN2 meeting. |
| Intel |  | Same view as others. LS should be sufficient.  |
| Huawei, Hisilicon | Agree |  |

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| Q 5: If relevant, please provide any additional items you consider needs be included in the LS |
| Company | Additional items |
| Swift Navigation | We don’t see any discussion in this questionnaire of point (1) of the stated objectives for this email discussion, nor do we see reference to the documents/proposals called out in the email objectives:Discuss coordination with RTCM, taking into account the way-forward proposals in R[2-2109807](file:///E%3A%5CWORK%5C1%203GPP%5CMeeting%5CRAN2%20116-e%5C2%20During%5CDocs%5CR2-2109807.zip) and related parts of R[2-2110181](file:///E%3A%5CWORK%5C1%203GPP%5CMeeting%5CRAN2%20116-e%5C2%20During%5CDocs%5CR2-2110181.zip):* Conclude on the intention to specify GNSS integrity signalling in Rel-17
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R2-2110181 made the following proposals:Proposal2-12a: Coordiante with RTCM on the following aspects:* + - * - If their initial draft spec will include SSR support, and if not when can this be expected?
			* - When exactly is it possible for RTCM to share their draft specifications?

Proposal2-12b: Take the following as the general guideline for working with RTCM on GNSS integrity in R17* + - * Continue the discussion in 3GPP for the discussion in GNSS integrity
			* Go with the basic support for GNSS integrity rather than seek for high target with high performance
			* Send the TP as agreed in 3GPP to confirm with RTCM when it is available
			* Open for CRs in R18 for alignment with RTCM as CRs to R17 GNSS positioning integrity

And R2-2109807 makes the following proposals:Proposal 1. RAN2 shall continue working on GNSS integrity during Rel17.Proposal 2. RAN2 to align its specs with RTCM via TEI17 once first RTCM integrity standard is available (foreseen for Q2 2022).Proposal 3. RAN2 to send a new LS to RTCM SC134 including agreements recorded during RAN2 116.We would like to see a discussion and alignment on these proposals. Specifically, we think the questions from Proposal2-12a should be included in the LS. We would also propose to ask RTCM SC134 to comment on the AD under consideration in [Post115-e][607] as we believe this is the most direct way to move the discussion forwards with RTCM. |
| Intel | We should decide in this meeting whether to continue/complete GNSS integrity in R17, and potentially align with RTCM via TEI.  |

1. GNSS Integrity – tentative draft LS to RTCM

Title: LS on GNSS integrity assistance data

Release: Release 17

Work Item: NR\_pos\_enh

Source: RAN2

To: RTCM SC134

Cc: RTCM

**Contact Person:**

Name: Florin Grec

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E-mail Address: florin-catalin.grec@esa.int

**Send any reply LS to: 3GPP Liaisons Coordinator, mailto:3GPPLiaison@etsi.org**

Attachments: TBC (pending companies agreement)

**1. Overall Description:**

3GPP RAN2 thanks RTCM for its liaison note sent on 3rd of September in reply to R2-2106596. First, we confirm that automotive, rail, and industrial IoT are the only use cases addressed in Release 17 of New Radio. Second, the scope of GNSS integrity work in 3GPP does not preclude any GNSS method at this moment and it is based on contributions. Lastly, for Release 17 of New Radio it was decided to focus only on GNSS integrity therefore 5G PRS and GNSS integration is not in scope of current release.

Through its LS RTCM clarified the scope and timeline adopted by SC134 for its first release of an integrity standard. At the moment, the work on GNSS integrity in RAN2 is expected to last until Q1 2022 and this is before RTCM target release date for the integrity standard. This time misalignments represents a challenge to our common goal of aligning views, at least for the near future and several points needs further clarifications.

RAN2 would like to learn from RTCM (Radio Technical Commission for Maritime Services):

* **Question 1 to X: Pending on agreements**

**Actions:**

**To RTCM SC134.**

**ACTION:** RAN2 respectfully asks RTCM SC134 to provide feedback on the above questions.

**3. Date of Next RAN2 Meetings:**

RAN2#116-bis-e 17th – 25th January 2022 Electronic meeting

RAN2#117-e 21st February – 3rd March 2022 Electronic meeting