Radio Technical Commission for Maritime Services
1150 18th Street NW, Suite 910
Washington, DC 20036
www.rtcm.org hq@rtcm.org
Telephone: +1-703-527-2000

September 03, 2021

RTCM Special Committee 134 on Integrity Monitoring for High Accuracy GNSS-Based Applications

Liaison Note to 3GPP RAN 2, Reply comments to letter R2-2106596

Question 1: RAN2 would like to ask RTCM SC134 whether the interest to collaborate on definition of GNSS integrity messages is still of interest.

Answer: RTCM SC134 is still interested to collaborate with 3GPP for the definition of GNSS Integrity messages

Question 2: RAN2 would like to ask RTCM SC134 to disclose the timeline and the scope of its work on a standard for GNSS integrity.

Answer
On March 26, 2018 RTCM, founded the Special Committee SC-134 on "Integrity for High Accuracy GNSS-Based Applications".

The mission of the committee is to analyze current and emerging high accuracy positioning applications though a multimodal approach and to develop standard messages and protocols required for Integrity Monitoring and Fault Detection and Exclusion (FDE). RTCM SC134 is organized in four Working Groups:

- WG1: Automotive
- WG2: Rail
- WG3: Maritime and other applications
- WG4: Harmonization of Requirements and Metrics

SC134 members include GNSS receiver manufacturers, augmentation service providers and software developers, as well as satellite operators and application stakeholders.

The committee began its work with a detailed requirements and safety analysis review for single application sectors. Next, an analysis and development of integrity parameters and messages for OSR and SSR high accuracy positioning technologies (RTK/NRTK, PPP, PPP-RTK) was conducted. A draft standard and accompanying technical notes have been developed as the integrity parameters and messages undergo refinement. Following RTCM standards development policies, a tight interoperability testing and approval process will be applied before release of a standard. Additionally, continuous cooperation and interaction with RTCM SC104 guarantees backward compatibility and while advancing high accuracy and high integrity standards within RTCM.

SC134 considers the sharing of activities and information with organizations at international level a fundamental requirement for the development of an effective multimodal standard. Therefore, regular liaison activity has been carried out with other standardization organizations. It must be

underlined that standardization is only one of the three legs of Standardization, Regulation, and Certification for the development of a standard for safety-related applications. For this scope, RTCM SC134 is in contact with application stakeholders.

The timeline for issuing a first release of the standard is mid-2022 with plans for maintaining the standard in the following years.

Question 3: Should a collaboration between 3GPP and RTCM be established, RAN2 would like to ask RTCM SC134 to share with RAN2 as much of their present work as is acceptable to their members considering that 3GPP documents, progress, and timeline represent public information.

Completed RTCM standards are public and available on the RTCM Website for a fee. RTCM Bylaws limits the distribution of Special Committee documents and draft standards to official members. Documents may be exchanged with participating liaison organizations. After a liaison is established, a mutual participation of members in relevant organization meetings is foreseen and documents are available and can be shared for the scope of the liaison activity.

Question 4: RAN2 would like to ask RTCM SC134 to provide feedback on the work carried out by RAN2 on GNSS integrity summarized in section 9.3.1.1 of TR 38.857. Specifically, what is RTCM's view on the commonalities and differences between the scope of work being considered in SC134 and the scope of work being considered in 3GPP.

Comments on TR 38.857

TR 38.857 will be discussed at on 27-28 September 2021 at the next SC-134 Plenary Meeting and specific comments to be sent to you.

Hereinafter are general comments on section 9.3.1.1 of the TR 38.857:

As a general consideration, quality indicator parameters, integrity flags definition and encoding are also central to the development for RTCM SC134.

Comment #1: are the presented use cases (Automotive, Rail, Industrial IoT) the only ones addressed by the Work Item?

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.

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.

Comment #4: Feared events definitions:

a) Satellite feared events. Due to the fact that current SBAS and broadcast health status flags cannot meet several application requirements, both in terms of TTA and IR, the task of the *GNSS-RealTimeIntegrity IE* is of paramount importance and should be further discussed in detail
b) *GNSS-SSR-STEC-Correction, GNSS-SSR-GriddedCorrection:* in general, multi-stage approaches can be developed and applied. It may be easier to generically discuss STEC and ZTD error

estimations here. RTCM SC134 is working on the design of Quality indicators for both local and gridded approaches.

c) Local Environment feared events: RTCM SC134 is working on advanced characterization and modelling of multipath.

Commonalities and differences between 3GPP and RTCM SC134

3GPPP and RTCM SC134 are both interested in developing standard messages and protocols for existing and emerging applications through a multi-modal approach, with similar application targets and particular reference to the transport world.
3GPP is of prominent relevance for mobile communication standardization and is interested in a detailed design of messages and protocols at network level for A-GNSS and SSR, originating from the 5G Architecture. 3GPP is not interested in Integrity Validation.
RTCM SC134 works with well-established RTCM GNSS High Accuracy standards and protocol and is interested to develop the features offered by 5G for efficient transmission of integrity messages for large scale applications for both OSR and SSR approaches. First messages have been designed, as well as an analysis on SSR integrity. RTCM SC134 is going to implement a test bed for both message coverage and basic Integrity Validation. Liaison activities have been carried out with international organizations and stakeholders involved in this process.
It is the opinion of RTCM that the 3GPP and RTCM SC134 tasks are complementary and dedicated liaison will support the objective of developing standards, urgently needed by the application sector, for both the GNSS and communication community in a shorter time.

- End of Document -