



**Twenty-first Meeting of the CAR/SAM Regional Planning and Implementation Group  
(GREPECAS/21)**  
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**Agenda Item 3: Global and Regional Developments**  
**3.3 CAR/SAM Air Navigation Services (ANS) Implementation Level**

**REGULATORY MEASURES ADOPTED IN BRAZIL TO MITIGATE INTERFERENCE  
DUE TO THE USE OF 5G IN THE 3,300- 3,700 MHz**

(Presented by Brazil)

**EXECUTIVE SUMMARY**

This paper presents information on the temporary mitigation measures adopted in Brazil to ensure safe coexistence between 5G stations and radio altimeters used in aviation.

The Department of Airspace Control (DECEA), the National Civil Aviation Agency (ANAC) and other aviation stakeholders have been working with the National Telecommunications Agency (Anatel) to provide a definitive solution to the issue of potential interference to aeronautical radio altimeters operating in the 4,200- 4,400 MHz frequency band, caused by IMT 5G stations currently operating or planned to operate in the 3,300- 3,700 MHz band, and how and when restrictions currently imposed on certain critical airports may be withdrawn.

<i>Strategic objectives:</i>	<ul style="list-style-type: none"> <li>• Safety</li> <li>• Environment Protection</li> </ul>
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**1. Introduction**

1.1 The National Telecommunications Agency (Anatel) submitted to comments and suggestions from the general public a proposal for Operational Requirements for 5G stations operating in the 3,300 – 3,700 MHz frequency band for the protection of radio altimeters operating in the 4,200- 4,400 MHz band (Public Consultation No. 36, May 20, 2022).

1.2 As a result of the Public Consultation, Anatel published ACT 9064, in force as of June 28, 2022, with the following decisions:

- a) *To establish, on a provisional and precautionary basis, that the main beams of the antennas used in base, nodal or repeater stations operating in the 3,300 MHz to 3,700 MHz sub-band, installed in areas close to the aerodromes (precautionary zone), have their pointing limited between the horizon line and below. The pointing limit applies to both AAS and non-AAS antennas.*
- b) *The precautionary zone (Figure 1) is bounded by the rectangle comprised by the following distances:*

- 2100 meters from the runway edge; and
  - 910 meters on each side of the runway centerline.
- c) For the 5G base, nodal or repeater station installed in the areas defined by the precautionary zone, the maximum power (EIRP), by polarization, must be limited to:
- 67 dbm/100 MHz, when operating in the 3,300 to 3,600 MHz sub-band;
  - 65 dBm/100 MHz, when operating in the sub-band above 3,600 MHz.

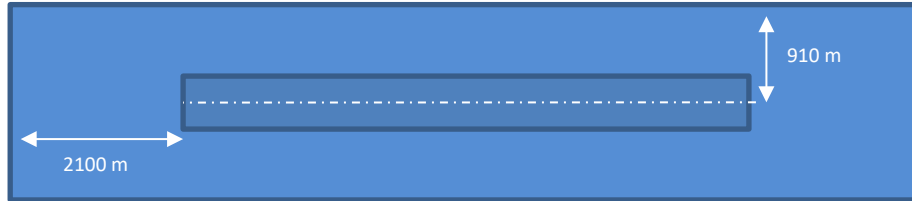


Figure 1- Precautionary zone limits (ANATEL ACT 9064/2022).

1.3 The TRP (Total Radiated Power) limit for 5G spurious emissions in the radio altimeter frequency band (4,200-4,400 MHz) was defined as -43 dBm/MHz, according to studies carried out by Anatel and ANAC. The conclusion was for no impact on the aircraft flying in Brazil with respect to spurious emissions.

1.4 The most critical scenarios identified were related to aircraft performing a precision approach to land in low visibility conditions, which in Brazil are the CAT I AR (authorization required), CAT II and CAT III approaches.

1.5 ANAC and DECEA provided a list of critical airports and runways that would need to be protected through precautionary zones (Figure 1), which were accepted by Anatel and published as an annex to ACT 9064.

1.6 In Brazil, the mitigated environment imposed by Anatel’s ACT 9064 (1.2 and 1.3), as described above, is adequate, given that many 5G stations are currently operating and, so far, there has been no report of interference resulting from 5G emissions.

## 2. Analysis

2.1 Anatel auctioned, in November 2021, 100 MHz spectrum blocks in the 3,300 to 3,700 MHz frequency band for 5G mobile service, divided amongst Brazilian operators. The purpose of the Auction is to guarantee licenses for the use of radio frequencies in the following frequency sub-bands:



2.2 This is the band of concern in Brazil due to the maximum power density levels and proximity to the radio altimeter frequency band of 4,200-4,400 MHz.

2.3 5G began to be implemented in July 2022 and is currently in operation in all capitals in Brazil and in many other cities.

2.4 Since the beginning of 2023, Brazilian main operators TIM, VIVO and CLARO, and other mobile service stakeholders are urging Anatel to release the restrictions imposed by ACT 9064/2022. For them, the airport restrictions interfere and make 5G planning difficult, leading consumers to complain about the experience obtained on the network in these locations.

2.5 Therefore, Anatel published ACT 1051, on February 1, 2023, proposing to review current restrictions in airport areas until July 31, 2023. That was recently done through the Anatel's Public Consultation No. 38, as of July 27, 2023, which proposes an amendment to ACT No. 9064 by removing the power limitations of 5G base stations in airport precautionary zones, returning to the nominal value of 75 dBm/100 MHz EIRP (10 dB higher than the EIRP previously determined by ACT 9064), which would come into force on October 16, 2023.

2.6 ANAC, DECEA and other aviation stakeholders submitted contributions to the consultation requesting more time for airlines to implement filters to protect aircraft radio altimeters.

2.7 Another important challenge to consider concerns how to address the need for retrofit (or limitations) of foreign-registered aircraft flying into Brazil, since an Airworthiness Directive (AD), for example, cannot impose any requirements to non-Brazilian registered airplanes. This issue is still being coordinated internationally by ANAC.

### **3. Conclusion**

3.1 The timing for retrofit, as proposed by Anatel, is unrealistic and very challenging for aircraft operators (around 150 aircraft affected), as it is not feasible to equip all aircraft that do not have resilient radio altimeters in one month. In addition, manufacturers would not have the production capacity to supply radio altimeters for the entire aircraft fleet in such a short time.

3.2 Coordination between ICAO and ITU could generate harmonized guidance.