Resolution 609 (Rev. WRC-07) Consultation Meeting
12 December 2025

Record of Decisions Taken at the Twenty-second Resolution 609 (Rev. WRC-07) Consultation Meeting

(Abu Dhabi, UAE, 10-12 December 2025)

The Twenty-second Resolution 609 (Rev. WRC-07) Consultation Meeting was convened, pursuant to the requirements of Resolution 609 (Rev.WRC-07), as a hybrid meeting during 10-12 December 2025. Around 41 delegates from Algeria, China, EU, France, Germany, India, Japan, Korea, Luxembourg, Pakistan, Russian Federation, UAE, UK and USA along with representatives of other organizations including the Radiocommunication Bureau (BR), participated physically in the 22nd RES609 meeting and 27 participants from Algeria, China, EU, France, India, Iran, Japan, Luxembourg, Malaysia, Nigeria, Russian Federation, USA were registered for virtual participation.

The following actions were taken regarding Resolution 609:

1. CM 22 discussed RNSS systems and networks submitted to CM 22, for which coordination information was received by the Bureau but not published as of five months in advance of the first day of the tentatively scheduled Meeting on a case-by-case basis. Those RNSS networks were accepted for inclusion in the calculations at CM 22 and hence CM 22 agreed to keep the Terms of Reference unchanged. A copy of the Terms of Reference is available in the Resolution 609 page maintained by the BR on the ITU web site (https://www.itu.int/en/ITU-R/space/Documents/res-609_ToR_M16.pdf). However, CM 22 agreed to review whether there is any requirement for revision of the Terms of Reference through email correspondence before the next Resolution 609 meeting.

2. CM 22 indicated a preference for future Resolution 609 (Rev. WRC-07) consultation meetings to be held in hybrid mode. CM 22 agreed a tentative date for the Twenty-Third Consultation Meeting on or around the 09 September 2026.

3. CM 22 did not provide changes on the format for the List of System Characteristics used in the calculations. The following points describe the List of System Characteristics required to be submitted by Administrations.

a. Section I-9 of Attachment 1 contains the format of the results of the epfd calculation for each RNSS individual system, in MS Excel format (see Attachment 2 as updated by the 16th Consultation Meeting, worksheet named "sheet 1_epfd_1_step"), using 1-degree steps in latitude and longitude. For non-GSO systems, administrations should also provide the time step and the number of time steps simulated.
b. The system spectral adjustment factors (SAF) provided under Section I-8 of Attachment 1 should be in MS Excel format (see Attachment 2, worksheet named "sheet 2_SAF").

CM 22 also recommends the following filename convention for electronic submissions:
CM#_ADM_SystemName_FileDescription_Ver#.

4. CM 22 followed the previous agreement with respect to the systems that had provided technical characteristics to a prior Consultation Meeting within the specified deadlines, that it was not necessary for the same technical information to be provided anew to this Consultation Meeting. The only requirement was a confirmation of these characteristics pursuant to §12 of the Terms of Reference.

5. CM 22 compared the results (obtained using 1-degree data) from the different tools used to determine the aggregate epfd produced by all considered RNSS systems. After discussions regarding the assumptions and methodologies used by each tool, CM 22 agreed on the specific epfd matrix to be retained for each RNSS system, with results obtained through the different tools being comparable. CM 22 agreed to continue the cross-verification of each tool and detailed methodologies for the single system/network epfd calculation.

6. CM 22 calculated the maximum aggregate epfd produced by all RNSS systems that provided/confirmed characteristics in accordance with the procedure contained in the Terms of Reference. Characteristics of RNSS systems considered under this calculation are contained in Attachment 3 (Word document), and the per-system epfd of each RNSS system is contained in Attachment 4 (Excel spreadsheet). The aggregate epfd calculations were computed for all the cases for all the possible combination of the configurations of each systems. As a result, the meeting determined that the maximum aggregate epfd of all satellites associated with the referenced RNSS systems was to be further investigated for four cases. The aggregate epfd calculations for these four cases are contained in Attachment 5 (Word document).

7. CM 22 determined that under its aggregate epfd calculations mentioned in No. 6, the maximum aggregate epfd of all satellites associated with the referenced RNSS systems would not exceed:

i. case 1 (EU-LNAV full constellation, Xona full constellation and SATNET LEO satellites in near polar orbits, transmit signal centered at 1178.496 MHz):

   -121.55 dB(W/(m^2·MHz)) at 1176 MHz and -121.51 dB(W/(m^2·MHz)) at 1191 MHz, i.e. 0.05 dB below and 0.01 dB below the Resolution 609 limit of -121.50 dB(W/(m^2·MHz)) respectively;

ii. case 2 (EU-LNAV full constellation, Xona full constellation and SATNET LEO satellites in near polar orbits, transmit signal centered at 1202.025 MHz):

   -121.55 dB(W/(m2·MHz)) at 1176 MHz and -121.50 dB(W/(m2·MHz)) at 1191 MHz, i.e. 0.05 dB below and 0.00 dB below the Resolution 609 limit of -121.50 dB(W/(m2·MHz)) respectively;

iii. case 3 (EU-LNAV IOD-A, IOD-B Option 2, LEGION LEO-PNT Pf-A and Pf-B E5#2, Xona full constellation and SATNET LEO satellites in near polar orbits, transmit signal centered at 1178.496 MHz):

   -121.53 dB(W/(m^2·MHz)) at 1176 MHz and -122.56 dB(W/(m^2·MHz)) at 1191 MHz, i.e. 0.03 dB below and 1.06 dB below the Resolution 609 limit of -121.50 dB(W/(m^2·MHz)) respectively;

iv. case 4 (EU-LNAV IOD-A, IOD-B Option 2, LEGION LEO-PNT Pf-A and Pf-B E5#2, Xona full constellation, SATNET LEO satellites in near polar orbits, transmit signal centered at 1202.025 MHz):

-121.53 dB(W/(m^2·MHz)) at 1176 MHz and -122.56 dB(W/(m^2·MHz)) at 1191 MHz,, i.e. 0.03 dB below and 1.06 dB below the Resolution 609 limit of -121.50 dB(W/(m^2·MHz)) respectively.

8. CM 22 agreed on a Report to the Radiocommunication Bureau that contains the results of the calculations mentioned in No. 6 and No. 7 above and directed that this Report be communicated to the BR in the manner contemplated in § 14 of the Terms of Reference. A copy of the Report to the Radiocommunication Bureau has been posted to the Resolution 609 page maintained by the BR on the ITU web site (https://www.itu.int/en/ITU-R/space/Pages/res609.aspx).

9. CM 22 agreed that it is important, for the orderly operation of the Resolution 609 (Rev. WRC-07) consultation process and to ensure the achievement of accurate calculation results, that administrations providing information to Consultation Meetings comply with the deadlines[1] established in the Terms of Reference.

10. CM 22 agreed to invite administrations to determine whether the pfd level in *recommends* 1 of Recommendation 608 (Rev.WRC-07) is exceeded by any space station of the corresponding RNSS systems, and to report the findings of this determination. CM 22 confirmed that all space stations of RNSS networks and systems except USASAT-NGSO-12 ("XONA PULSAR"), considered for inclusion in the aggregate epfd calculation, pursuant to § 6, do not exceed the pfd level in *recommends* 1 of Recommendation 608 (Rev.WRC-07). CM 22 reminds administrations that section 7bis of the ToR for the Consultation Meeting explicitly invites administrations to conduct this pfd analysis using submitted data rather than data from the filings.

11. During the development of the RNSS systems in this band, there will be some temporary situations, such as the transition of some systems from one phase to another (e.g. regional to global service transition, orbital relocation, or satellite back up) that could affect the aggregate epfd. At present, recognizing the need to protect ARNS, CM 22 agreed to calculate the aggregate epfd by using the worst-case epfd of such RNSS systems in both phases. Once the transition is completed, the aggregate RNSS emissions will decrease.

12. Previous consultation meetings determined that if there is a predicted exceedance of the maximum aggregate epfd by operational systems and networks, the first step to be taken in resolving the exceedance will be to have any administration with any operational satellite that exceeds the maximum per-satellite pfd level in Recommendation 608 (Rev. WRC-07) to reduce the maximum pfd produced at the surface of the Earth, for all angles of arrival, to or below -129 dB(W/m^2) in any 1 MHz band under free space propagation conditions. Only if this does not resolve the exceedance should other appropriate modifications be considered under *resolves 2* of Resolution 609 (Rev. WRC-07). CM 21 agreed to continue the discussion on methods to avoid exceedance of the aggregate epfd limit at future meetings and proposed to

[1] The meeting noted the delayed reception of some satellite networks/systems. The meeting also noted that the submissions of some of such satellite networks/systems were delayed for multiple consecutive meetings. Furthermore, some of such satellite networks/systems did not officially make any submission at this meeting. Though such satellite systems/networks were taken into account at this meeting, the meeting discussed how to avoid such delayed or no submission in future meetings.

initiate studies prior to CM 22 to evaluate methods to avoid exceedance of the aggregate epfd limit.

13. At CM 22, using the input data, calculations showed that exceedance was observed for the center frequency of 1176 MHz only.
Some proposed steps to be taken appears in item 12. Other appropriate modifications considered during CM 22 are:

- use of actual operational link characteristics for computation of maximum aggregate epfd;
- reduction in the list of candidate systems, e.g., in cases when a demonstrator and the full constellation will not operate simultaneously, or when a system has been replaced by a new system.

14. CM 22 addressed this scenario to reduce the aepfd exceedance at 1176 MHz:
It was observed that all the networks and systems that are mainly contributing towards the aepfd exceedance at 1176 MHz are in compliance with the maximum per-satellite pfd level in Recommendation 608. Since CM 22 predicted possible exceedance of the maximum aggregate epfd by all the submitted RNSS systems/networks at the frequency 1176 MHz, a number of decisions to reduce the calculated maximum aggregate epfd values were made as follows:

- Reduction of the e.i.r.p. density level submitted to RES 609 CM 22 by the KPS GSO network and N-GSO systems by 0.3 dB.
- Commitment not to operate the full GALILEO-2G constellation at the same time as the GALILEO-L3 satellites*
- Commitment not to operate full constellation of France's SYNCHROCUBE* at the same time with Demonstrator 2024*
- Commitment not to operate full constellation of UAE's NSAT01.001 at the same time with NSAT01*
- Commitment for the IOD/LEGION LEO-PNT (EU LNAV) * satellites not to operate simultaneously with the full EU LNAV constellation
- Commitment for the XONA PULSAR (IOV) * satellite not to operate simultaneously with the XONA PULSAR full constellation.

*Though there was no explicit aggregate epfd calculation in the above four cases including GALILEO-L3, Demonstrator 2024 of SYNCHROCUBE, NSAT01.001, some configurations of IOD/LEGION LEO-PNT of EU-LNAV and XONA IOV the meeting agreed that the emissions of these satellite networks are covered by their full constellations.

With the application of these measures, CM 22 determined that compliance with the aggregate epfd limit in Resolution 609 is achieved.

15. USA presented a document on "USASAT-NGSO-12 "Xona Pulsar" Rec. 608 Compliance and Equitable Sharing of EPFD". In this document, the USA reminded participants of the intent and purpose of Recommendation 608, which is stated as "in the implementation of resolves 5 of Resolution 609 (Rev.WRC-07)." In this document, USA also provided data on the systems contributing the most epfd towards the aggregate epfd limit specified in Res. 609. Administrations requested further details regarding the analysis for further discussions. USA and other Administrations agreed that it could be beneficial to continue discussions through the on-going relevant work being conducted at ITU-R WP 4C.

16. CM 22 recognizes several tools may be available to avoid exceedance of the Resolution 609 aggregate epfd limit. As long-term measures, appropriate modifications listed below can be considered to avoid exceedance of the aggregate epfd limit:

- use of actual operational link characteristics (e.g., maximum operational power levels, instead of filed parameters) should be continued to be encouraged;
- for compliance with the epfd limit specified for RNSS, new entrants are urged to take various actions including operation in other portions than the worst-case epfd frequency ranges in the band 1 164-1 215 MHz;
- revisions to the epfd calculation methodology to avoid the addition of different worst cases and revisiting some assumptions (e.g. orbit propagation model) may be considered in the future to produce more realistic results, rather than simple addition of worst-case epfd calculation results of each system;
- geographical analysis of peak aggregate RNSS epfd areas with a view to informing future RNSS systems about areas where RNSS emissions are closest to the epfd limit.

CM 22 agreed to continue the discussion on methods to avoid exceedance of the aggregate epfd limit at future meetings. CM 22 also acknowledged that it could be beneficial to contribute to ITU-R WP-4C on further development of the Preliminary Draft New Report ITU-R M.[RES.609] to avoid exceedance of the aggregate epfd limit. The next meeting of ITU-R WP 4C is planned for 22 April-1 May 2026. For information to all the participants, the current Working Document towards a Preliminary Draft New Report ITU-R M.[RES.609], "*Potential mitigation methods to ensure the aggregate equivalent power flux-density (epfd) limit on radionavigation-satellite service (RNSS) systems and networks operating in the 1 164-1 215 MHz band, from resolves 1 of Resolution* ***609 (Rev.WRC-07),*** *is not exceeded*" was presented during the meeting and made available in the CM 22 TEMP Documents SharePoint folder with some corrections and highlighting (see file *R23-WP4C-C-0528!N20!WD-PDNRepM.[RES.609]TH.docx*).

17. CM 22 received updates on the status of some of the RNSS systems and networks operating or planned to operate in the band 1 164-1 215 MHz. This updated information based on received contributions is shown in the document: "RNSS_systems_or_networks_status_22nd CM.docx." CM 22 noted that the use of the band 1 164-1 215 MHz by both non-geostationary and geostationary RNSS systems and networks today is substantial. Since the purpose of the status document is for information use only, it has been posted to the Res. 609 page on the ITU website, but not attached to this Record of Decisions.

18. CM 22 expressed the urgent need that all efforts are made to ensure that all administrations with filings and concrete plans to operate RNSS systems in the 1 164-1 215 MHz band participate fully and on a continuing basis in the mandatory Resolution 609 consultation process, including submitting materials in accordance with the Terms of Reference and attending the meetings (See also item 9 of this Record of Decision). In this regard, CM 22 expressed its gratitude to the Bureau for issuing Circular Letter CR/521 reminding all administrations with filings for RNSS frequency assignments in the 1164-1215 MHz frequency band of their obligation to participate in Resolution 609 (Rev. WRC-07) Consultation Meetings and encouraged the Bureau to continue reaching out to those administrations that have not participated fully and on a continuing basis in the Resolution 609 consultation process. This is to encourage them to participate at their earliest opportunity where appropriate, and highlighting the mandatory nature of the Resolution 609 (Rev. WRC-07) Consultation Meeting for those systems/administrations with concrete plans to operate RNSS systems in the 1 164-1 215 MHz band including the information related to maximum aepfd levels at certain

frequency ranges. CM 22 agreed that the dates, and if relevant, the venue, for the meeting should be determined with as much notice as possible for all delegates.

19. As the existing Convenor of Resolution 609 Consultation Meeting Ms. Sofi Jebasoundaram from the Indian Administration and Vice-convenor Ms. Xia Ge from the Chinese administration have been in place for three years, the meeting agreed that Ms. Xia Ge from Chinese administration will serve for the next three years as the new Convenor for the Resolution 609 Consultation Meeting. She will be assisted by Mr. Kamran Ahmed from Pakistan as Vice-convenor.

20. CM 22 expressed its gratitude to the ITU BR for their continued participation as an observer and to the administration of UAE for hosting CM 22.

List of Attachments

Attachment 1 (Word document): Input format required for RNSS system characteristics.

Attachment 2 (Excel spreadsheet):

> Sheet 1 (“sheet 1_epfd_1_step”). Template for Section I-9 of Attachment 1, longitude/latitude (note orientation change) format for individual system epfd calculation results (1-degree steps).
> Sheet 2 (“sheet 2_SAF”). Template for Section I-8 of Attachment 1, spectral adjustment factors (SAF) relative to the worst 1 MHz.

Attachment 3 (Word document): RNSS System Characteristics provided and confirmed to have met the submission criteria in the Terms of Reference.

Attachment 4 (Excel spreadsheet): Simulated per-system epfd of each RNSS system using the 1-degree data available in Attachment 3.

Attachment 5 (Word document): Aggregate epfd calculations for all cases with the referenced RNSS systems.