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Radio Navigation Satellite Service and the ITU Radio Regulations

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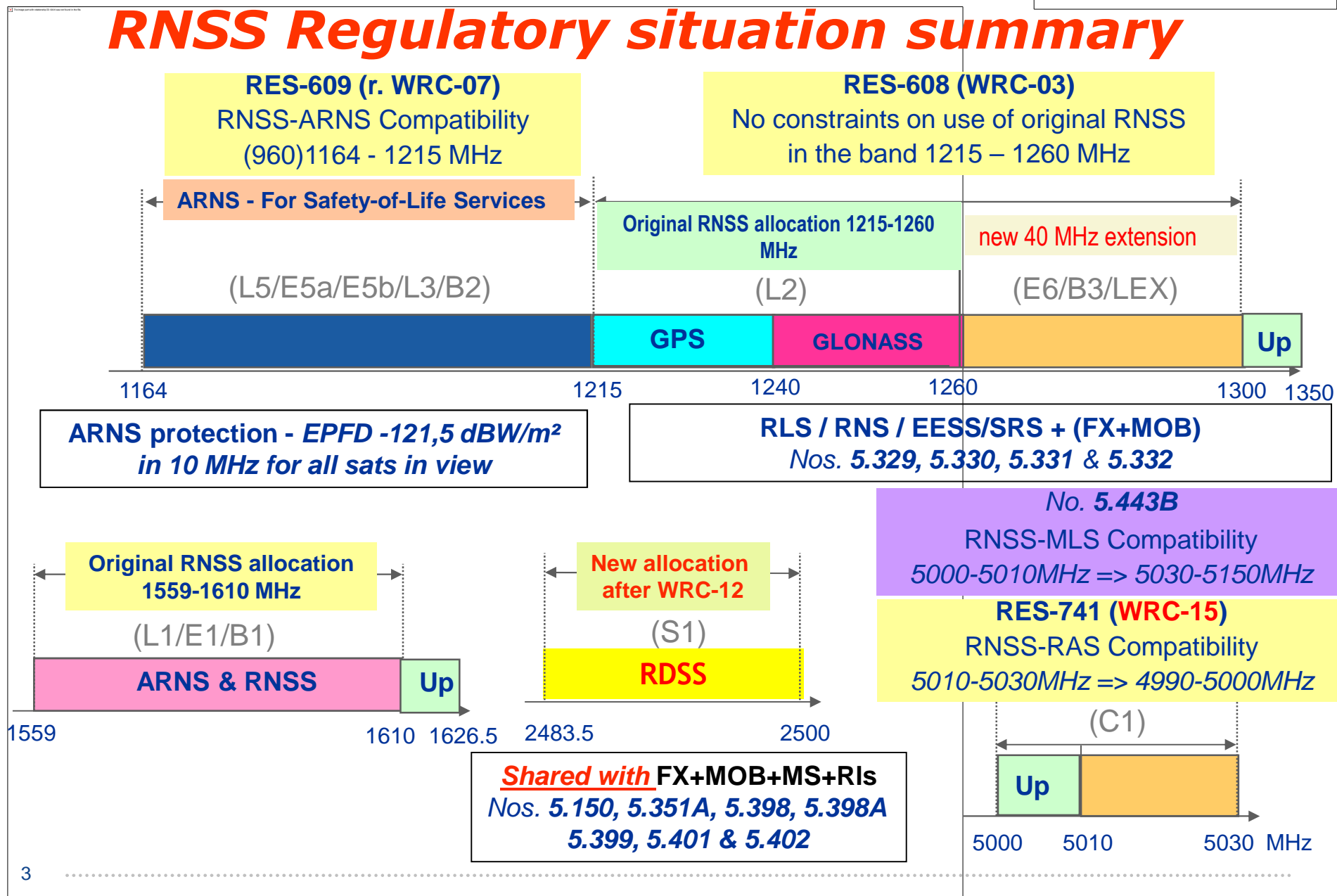
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➤ **Definitions from the ITU Radio Regulations (RR)**

- No. **1.43** ***radionavigation-satellite service (RNSS):***
A radiodetermination-satellite service used for the purpose of radionavigation
- No. **1.59** ***safety service:***
Any radiocommunication service used for the safeguarding of human life and property
- No. **4.10** Member States recognize that the safety aspects of radionavigation and other safety services require special measures to ensure their freedom from harmful interference; it is necessary therefore to take this factor into account in the assignment and use of frequencies.

RNSS Regulatory situation summary



RNSS allocation 1 164 - 1 215 MHz

1 164 MHz

1 215 MHz

RNSS

- epfd limit shared by **all** RNSS
 $\leq -121.5 \text{ dB(W/m}^2\text{-1MHz)}$ (No. 5.328A / RES-609)

ARNS

960 MHz

How to share this limit ?

'Real' RNSS
systems only

Satisfy **milestone**
criteria annexed to
RES-609 (WRC-03)



PFD limit per
RNSS space
station

$\leq -129 \text{ dB(W/m}^2\text{·MHz)}$
REC-608 (WRC-03)



Consultation
Meeting

*The Bureau participates /
observes / publishes results
in the BR IFIC*



RNSS allocation **1 215 - 1 300 MHz**

1215 MHz

1260 MHz

1300 MHz

RNSS

RNSS

RLS & RNS

- Retained existing protection of **RNS** - Nos. **5.329&5.331**
- Extended protection to **RLS** - No. **5.329**
- FX and MOB is **PRIMARY** in *some countries* – No. **5.330**

No additional constraints for original RNSS systems, if brought into use before WRC-2000 –

see RES-608

1559 MHz

1610 MHz

1626.5 MHz

RNSS allocation **1 559 - 1 610 MHz**



Administrations are urged to take all practicable steps to protect the RNSS and not authorize ANY frequency assignments to fixed-service systems in this band

RNSS filing after 1 January 2005 is subject to the application of the provisions of Nos. **9.12**, **9.12A** and **9.13**.

2483.5 MHz

2500 MHz

New global RNSS allocation **2483.5 – 2 500 MHz**

RDSS

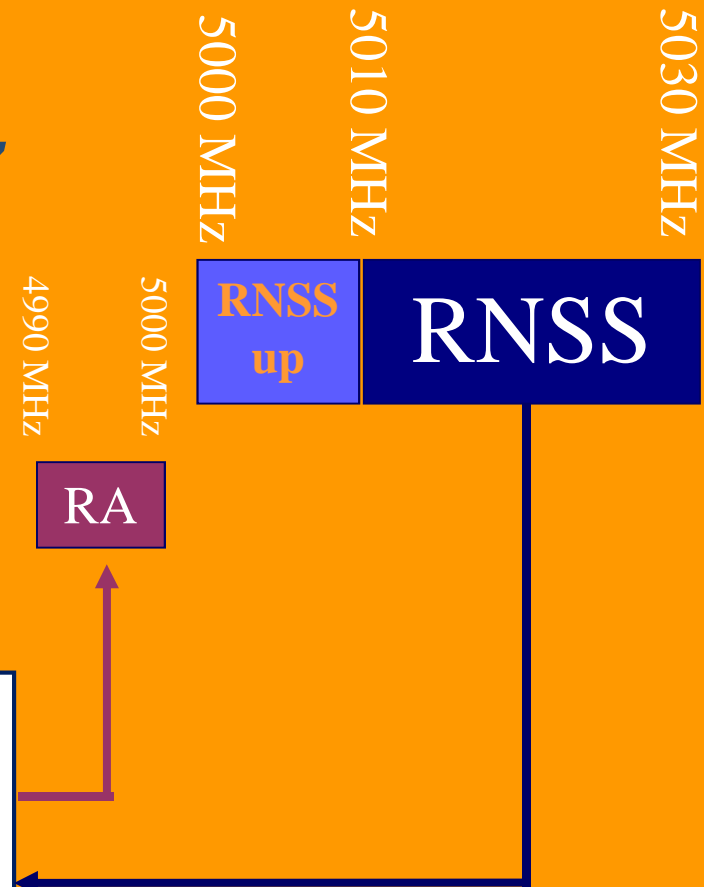
FX & MOB & MS

Radiolocation

Nos. **5.398A & 5.399** In...(ADM list), this band is allocated on a primary basis to the radiolocation service.

- No. **5.398** In respect of the RDSS, the provisions of No. **4.10** do not apply.
- No. **5.401** In...(ADM list) this band was already allocated on a primary basis to the RDSS before WRC-12, subject to agreement obtained under No. **9.21** from countries not listed in this provision. Systems in the RDSS for which complete coordination information has been received by the Bureau before 18 February 2012 will retain their regulatory status, as of the date of receipt of the coordination request information.
- No. **5.402** The use of the band 2 483.5-2 500 MHz by the MS and the RDSS is subject to the coordination under No. **9.11A**.

RNSS allocation 5 000 - 5 030 MHz



PFD limit (GSO RNSS) & EPFD limit (NGSO RNSS)

$PFD \leq -171 \text{ dB}(W/m^2 \cdot 10\text{MHz})$ for **any** GSO RNSS
 $EPFD \leq -245 \text{ dB}(W/m^2 \cdot 10\text{MHz})$ by **all** NGSO RNSS
2% of time, over 5deg elevation; over RA band

- **RES-741 (rev.WRC-15)**
- **No. 5.443B** also no interference to the MLS

➤ The ITU BR is maintaining a special web site and web forum

RES-609 Consultation meeting (CM)

- posting of required information from administrations
- exchange of information
- posting the results of the epfd calculation from the participants of the RES-609 CM
- posting the results of all RES-609 CM

<http://www.itu.int/ITU-R/space/res609/>

- **ITU-R WP 4C** is responsible for studies related to all mobile-satellite services including **RNSS**
 - Studies on the RNSS are very active
 - **Sharing** and **protection criteria** have been intensively investigated for existing spectrum allocation for RNSS
 - Studies are also on-going for newly allocated bands for future enhancements and newly planned RNSS systems, addressing **frequency sharing with other services**
 - These studies contribute not only to the development of **ITU-R M Series Recommendations** but also to **WRC** preparation
 - **Free online access**
 - *to the current ITU-Radio Regulations @ 2012:*
<http://www.itu.int/pub/R-REG-RR-2012>
 - *to all ITU-R Recommendations:*
<http://www.itu.int/publ/R-REC/en>

➤ **List of most important ITU-R Recommendations related to RNSS (1)**

- **ITU-R M.1582** - Method for determining coordination distances, in the 5 GHz band, between the international standard microwave landing system stations operating in the aeronautical radionavigation service and stations of the radionavigation-satellite service
- **ITU-R M.1787** - *Description of systems and networks in the radionavigation-satellite service and technical characteristics of transmitting space stations operating in the bands 1 164-1 215 MHz, 1 215-1 300 MHz and 1 559-1 610 MHz*
- **ITU-R M.1831** - *A coordination methodology for RNSS inter-system interference estimation*
- **ITU-R M.1901**- Guidance on ITU-R Recommendations related to systems and networks in the radionavigation-satellite service operating in the frequency bands 1 164-1 215 MHz, 1 215-1 300 MHz, 1 559-1 610 MHz, 5 000-5 010 MHz and 5 010-5 030 MHz
- **ITU-R M.1902** - Characteristics and protection criteria for receiving earth stations in the radionavigation-satellite service (space-to-Earth) operating in the band 1 215-1 300 MHz

➤ **List of most important ITU-R Recommendations related to RNSS (2)**

- **ITU-R M.1903** - Characteristics and protection criteria for receiving earth stations in the radionavigation-satellite service (space-to-Earth) and receivers in the aeronautical radionavigation service operating in the band 1 559-1 610 MHz
- **ITU-R M.1904** - Characteristics, performance requirements and protection criteria for receiving stations of the radionavigation-satellite service (space-to-space) operating in the frequency bands 1 164-1 215 MHz, 1 215-1 300 MHz and 1 559-1 610 MHz
- **ITU-R M.1905** - Characteristics and protection criteria for receiving earth stations in the radionavigation-satellite service (space-to-Earth) operating in the band 1164-1 215 MHz
- **ITU-R M.1906** - Characteristics and protection criteria of receiving space stations and characteristics of transmitting earth stations in the radionavigation-satellite service (Earth-to-space) operating in the band 5 000-5 010 MHz