Direction des Services
de la Navigation
Aérienne

dgac
DSNA

WRC-12
A.I. 1.7

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DGAC-DSNA

Ressources, territoires, habitats et logement
Énergie et climat
Développement durable
Prévention des risques
Infrastructures, transports et mer

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RÉPUBLIQUE FRANÇAISE

Ministère de l'Écologie, de l'Énergie, du Développement durable et de la Mer

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- Overview on the studies made on the spectrum requirements
- Analysis of the different « invites » of resolution 222
- Process proposed under modifications of Res 222 (method B)
- Conclusion

Overview (R.R)

1 530-1 535 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A 5.353A Earth exploration-satellite Fixed Mobile except aeronautical mobile 5.341 5.342 5.351 5.354	**1 530-1 535** SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A 5.353A Earth exploration-satellite Fixed Mobile 5.343 5.341 5.351 5.354
1 535-1 559	MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A 5.341 5.351 5.353A 5.354 5.355 5.356 5.357 5.357A 5.359 5.362A
1 559-1 610	AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.208B 5.328B 5.329A 5.341 5.362B 5.362C

5.357A

Overview (R.R)

5.357A In applying the procedures of Section II of Article 9 to the mobile-satellite service in the bands **1 545-1 555 MHz and 1 646.5-1 656.5 MHz**, **priority shall be given to accommodating the spectrum requirements of the aeronautical mobile-satellite (R) service** providing transmission of messages with priority 1 to 6 in Article **44.** Aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article 44 shall have priority access and immediate availability, by pre-emption if necessary, over all other mobile-satellite communications operating within a network. Mobile-satellite systems shall not cause unacceptable interference to, or claim protection from, aeronautical mobile-satellite (R) service communications with priority 1 to 6 in Article 44. Account shall be taken of the priority of safety-related communications in the other mobile-satellite services. (**The provisions of Resolution 222 (WRC-2000)* shall apply.)** (WRC-2000)

Overview (Res.222 (Rev WRC-07))

Resolves that administrations shall ensure;

1 that the spectrum needed for AMS(R)S communications within priority categories 1 to 6 of Article 44 in the bands where No. 5.357A applies, is accommodated;

2 the use of the latest technical advances, in order to achieve the most flexible and practical use of the generic allocations;

3 that MSS operators carrying non-safety-related traffic yield capacity, as and when necessary, for AMS(R)S communications within priority categories 1 to 6 of Article 44;

Invites ITU-R

i) to study the existing and future spectrum requirements of the AMS(R)S

ii) to assess whether the long-term requirements of the AMS(R)S can be met within the bands 1 545-1 555 MHz and 1 646.5-1 656.5 MHz

iii) to complete studies to determine the feasibility and practicality of technical or regulatory means in order to ensure adequate access to spectrum to accommodate the AMS(R)S requirements

iv) if the assessment indicates that these requirements cannot be met, to study existing MSS allocations or possible new allocations

Invites ICAO and IATA to participate studies identified above

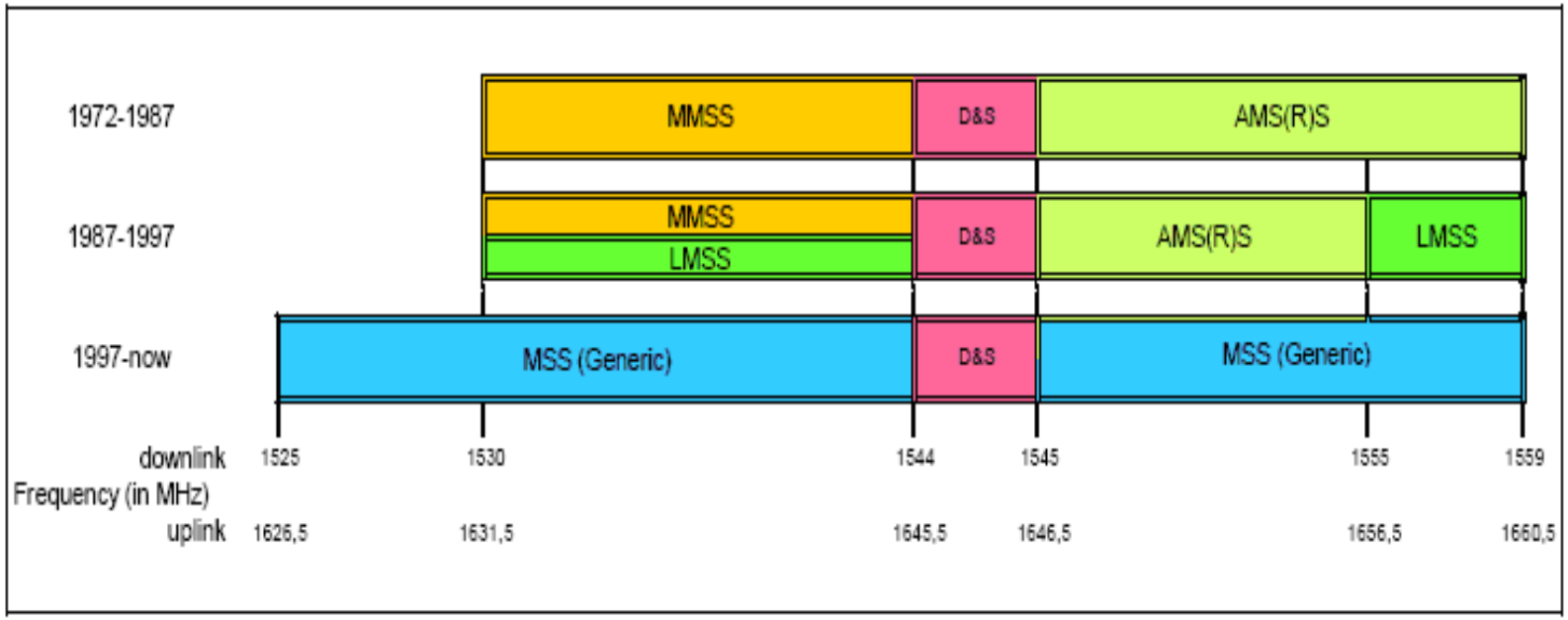
Overview (A.I. 1.7)

To consider the results of ITU-R studies in accordance with Resolution 222 (Rev.WRC-07) in order to ensure long-term spectrum availability and access to spectrum necessary to meet requirements for the aeronautical mobile-satellite (R) service, and to take appropriate action on this subject, while retaining unchanged the generic allocation to the mobile-satellite service in the bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz

Key Points

- Consider the results of the studies of Res.222 at WRC-12
- Take appropriate action on this subject
- Retain unchanged the generic allocation to MSS
- In the bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz

Historical


1972-1987
MMSS
D&S
AMS(R)S
1987-1997
MMSS
LMSS
D&S
AMS(R)S
LMSS
1997-now
MSS (Generic)
D&S
MSS (Generic)
downlink
Frequency (in MHz)
uplink
1525
1530
1544
1545
1555
1559
1626,5
1631,5
1645,5
1646,5
1656,5
1660,5

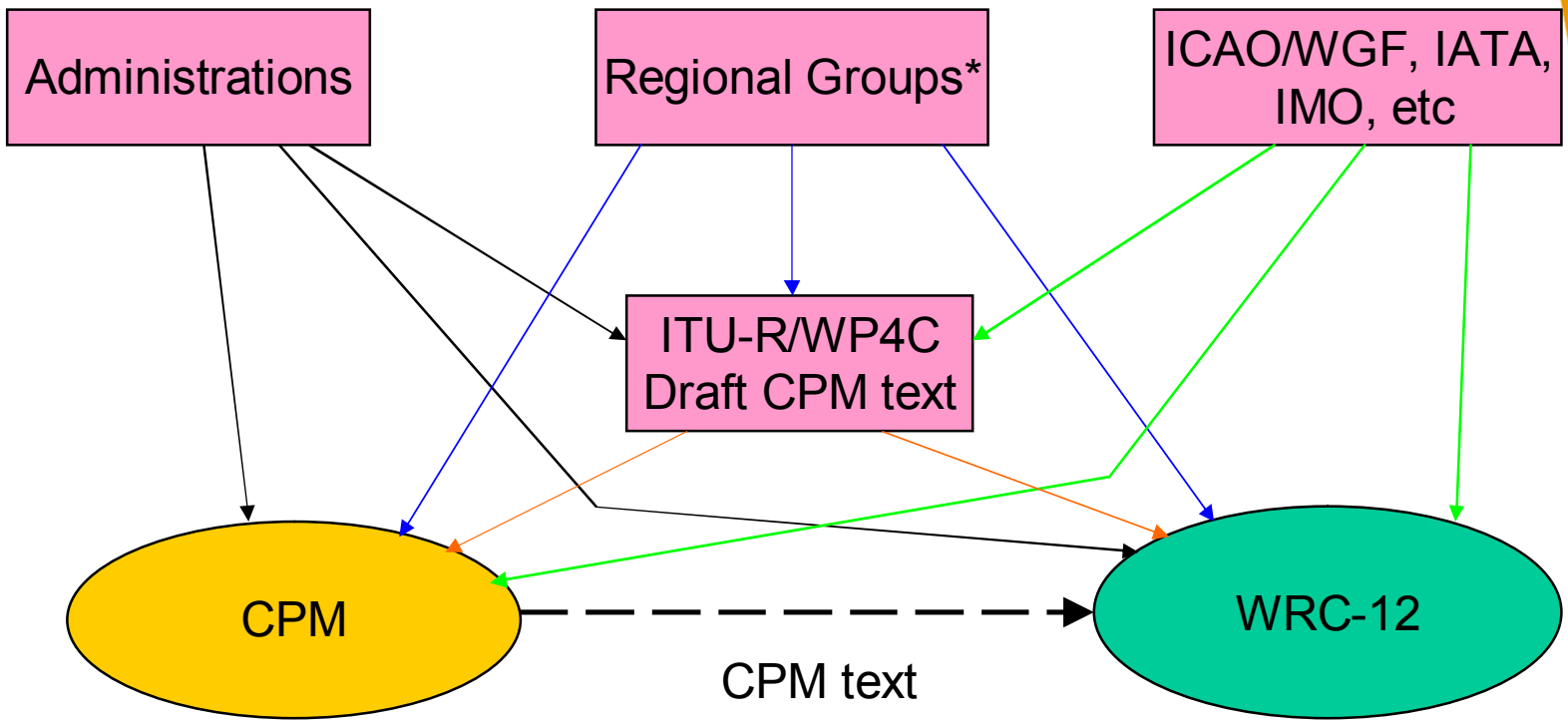
Coordination process in force

- Multilateral approach has been adopted by the Administrations having notified MSS systems through Memoranda of Understanding (MoU), one for MSS systems in Region 2 and one for systems in Regions 1&3.
- Coordination and assignment of spectrum to MSS networks in these frequency allocations is carried out through yearly multilateral Operator Review Meetings (ORM).
- Dynamic process, allowing for the frequency assignments to each operator to be reviewed annually and by making assignments based on the operators' short term needs.
- The projected spectrum requirements for AMS(R)S applications are included in the discussions of spectrum assignments of the ORM.
- The spectrum in the bands for which No 5.357A applies is currently used for safety and non-safety applications
- In Region 1&3 the participants on the ORM are : Inmarsat (GB), Thuraya (UAE), ESA (France), VOLNA (Russia), ACeS (Indonesia), Optus (Australia), NAVISAT (Egypt), and MTSAT (Japan).

Considerations

- Some views are that under the current ORM process, the capacity-planning approach leads to difficulties for new or existing AMS(R)S systems to get priority access to spectrum within the frequencies specified by No. 5.357A.
- The ORM are only attending by mobile satellite operators and the results of the ORM are not publicly available. This lack of transparency could potentially leads to problems for new or existing AMS(R)S operators whom have to provide safety of life services.
- There are 2 different and independent MoUs. Assignments made in Region 1&3 may not necessarily be compatible with those made in Region 2, thus additional constraints will be experienced on the operations of an AMS(R)S system, in particular if the system provides a coverage overlapping the two areas.

Activities



* APT: Asia & Pacific, ATU: Africa, CEPT: Europe, CITEL: Americas, LAS: Arab, RCC: Commonwealth

ITU-R Discussions

- ✓ Draft ITU-R report M.[AMSRS SPECTRUM ESTIMATE] - AMS(R)S communication requirements forecasts and estimated future spectrum requirements
- ✓ No consensus on the methodologies, the assumptions and the figures.
- ✓ All studies show that the spectrum requirements would be lower than 3.3 MHz (forward link) and 1.3 MHz (return link) in 2025

Methods proposed in CPM report

4 methods are all proposing no change to RR articles 5 and 9.

The difference between these methods are essentially on the modifications proposed on Res.222 as indicated hereafter :

- **Method A** : NOC (UAE, UK, …)
- **Method B** : modification to Resolution 222 (Brazil, Egypt, France, Germany, ICAO, Japan, Luxembourg, …)
- **Method C** : use of the existing AMS(R)S allocation in the 5 GHz band (RF). Not yet studied.
- **Method D** : modification to Resolution **222 (Rev.WRC-07)** identifying the coordination process used to ensure long-term spectrum availability and access for the AMS(R)S, with coordination meetings only. A new Resolution proposing to develop an agreed ITU-R methodology to determine spectrum requirements of AMS(R)S communications (Canada, USA, …).

Overview on the studies made on the spectrum requirements

Results of worst case long-term regional AMS(R)S spectrum requirements

	Coverage	Forward link (MHz)	Return link (MHz)
ESA	Europe/North Atlantic Ocean	3.3	1.3
Brazil	Brazil/South Atlantic Ocean	0.648	0.715
Japan	Asia-Pacific Ocean	0.809	0.809
UK	Europe/North Atlantic Ocean	2.7	0.235
Egypt	Middle-East/ Africa	[1.730](under revision)	[3.118](under revision)
Maximum value		**3.3**	**1.3**

Results of worst case long-term global AMS(R)S spectrum requirements

	Coverage	Forward link (MHz)	Return link (MHz)
ESA	Global	4.2	1.6
Japan	Global	2.428	2.428
UK	Global	2.7	0.235
UAE	Oceanic only	1.08	1.08
Maximum Value		**4.2**	**2.428**

Analysis of the different « invites » of resolution 222 (1)

- **Invites ITU-R (i): "*to study, as a matter of urgency, the existing and future spectrum requirements of the aeronautical mobile-satellite (R) service;*"**

  – Based on a review of several contributions providing the results of a wide range of studies of the long-term AMS(R)S spectrum requirements, both at the regional and the global level, and for a variety of AMS(R)S technologies, it is concluded that this study item has been fulfilled and can be deleted.

- **Invites ITU-R (ii): *"to assess whether the long-term requirements of the AMS(R)S can be met within the existing allocations with respect to No. 5.357A while retaining unchanged the generic allocation for the mobile-satellite service in the bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz, and without placing undue constraints on the existing systems operating in accordance with the Radio Regulations"***

  – The results of the studies conducted under the previous study item show that the AMS(R)S long-term spectrum requirements can be met in the current 2 x 10 MHz band referenced in No. 5.357A without causing undue constraints to MSS. Therefore, the assessment called for by this clause can be considered completed.

  – This item can be deleted.

Analysis of the different « invites » of resolution 222 (2)

- **Invites ITU-R *(iii): "to complete studies to determine the feasibility and practicality of technical or regulatory means, other than the coordination process referred to in resolves 1 or the means considered in Report ITU-R M.2073, in order to ensure adequate access to spectrum to accommodate the AMS(R)S requirements as referenced in resolves 3 above, while taking into account the latest technical advances in order to maximize spectral efficiency"***

  - With regard to the determination of *technical* means mentioned in this "*invites*", this is addressed by ongoing improvements in the efficient use of spectrum by both MSS and AMS(R)S satellite systems.
  - With regard to the *regulatory* means mentioned in this "*invites*", Method B of the draft CPM text, by the proposed modifications of Resolution 222 addressed this study
  - So, this item can be deleted.

Analysis of the different « invites » of resolution 222 (3)

- **Invites ITU-R *(iv): "if the assessment identified in invites ITU-R (i) and (ii) indicates that these requirements cannot be met, to study existing MSS allocations or possible, new allocations only for satisfying the requirements of the aeronautical mobile satellite (R) service for communications with priority categories 1 to 6 of Article 44, for global and seamless operation of civil aviation taking into account the need to avoid undue constraints on existing systems and other services"***

  - On the basis of the results of the studies conducted under "*invites*" (i) and (ii), it is concluded that this study item has been fulfilled insofar as no additional studies are required for new or existing allocations.
  - Hence this item can be deleted.

Process proposed under modifications of Res 222 (method B) (1/3)

resolves

1 that, in frequency coordination of MSS in the bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz, notifying administrations of the MSS networks shall ensure that the spectrum needed for distress, urgency and safety communications of GMDSS, as elaborated in Articles **32** and **33**, in the bands where No. **5.353A** applies, and for the AMS(R)S communications (within priority categories 1 to 6 of Article **44**) in the bands where No. **5.357A** applies is accommodated;

2 that notifying administrations of the MSS networks shall ensure the use of the latest technical advances, in order to achieve the most flexible, efficient and practical use of the generic allocations;

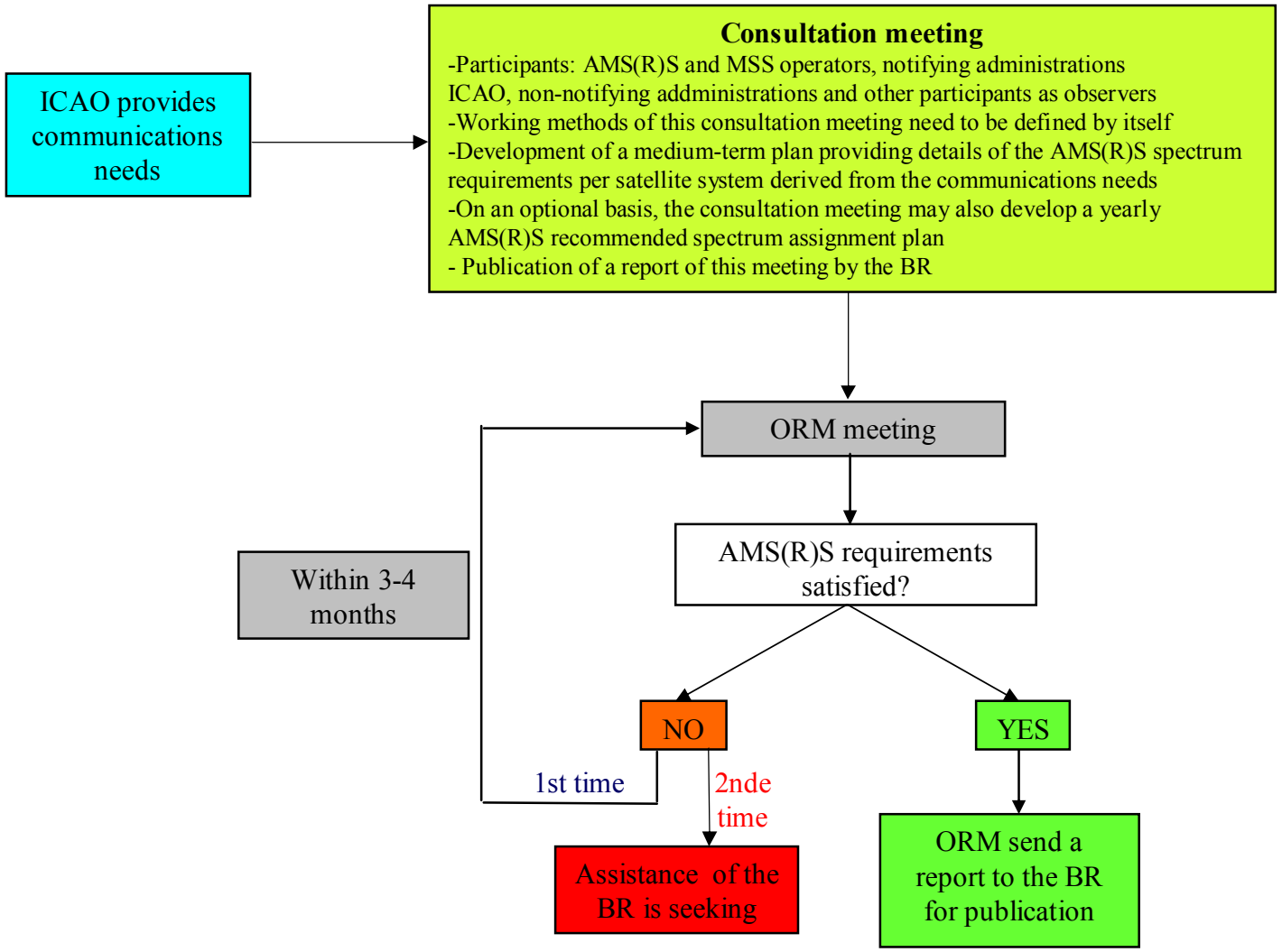
3 that notifying administrations of the MSS networks shall ensure that MSS operators carrying non-safety-related traffic yield capacity, as and when necessary, to accommodate the spectrum requirements for distress, urgency and safety communication of GMDSS communications, as elaborated in Articles **32** and **33**, and for the AMS(R)S communications (within priority categories 1 to 6 of Article **44**);

Process proposed under modifications of Res 222 (method B) (2/3)

4 that administrations operating or planning to operate AMS(R)S systems shall justify and agree collectively their spectrum requirements for the AMS(R)S communications (within priority categories 1 to 6 of Article **44**), taking into account *resolves* 2, through a consultation meeting held under the provisions contained in Annex 1 to this Resolution;

5 that, at frequency coordination meetings, priority shall be given when assigning frequencies to meet the AMS(R)S spectrum requirements that were justified and agreed as specified in *resolves* 4 above,

Process proposed under modifications of Res 222 by adding the annex 1 to Res 222 (method B) (3/3)



Conclusion

- Importance of ICAO's guidance to administrations due to their expertise in aviation matters.

- Importance of having supports from administrations to ICAO's position in ITU-R in order to obtain favorable decisions at WRC-12 for aviation community.

THANK YOU FOR YOUR ATTENTION!

QUESTIONS?