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INTERNATIONAL CIVIL AVIATION ORGANIZATION

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ICAO WRC-27 Preparatory Workshop

Agenda item AI 1.13:
Direct Satellite Connectivity to IMT Equipment Users

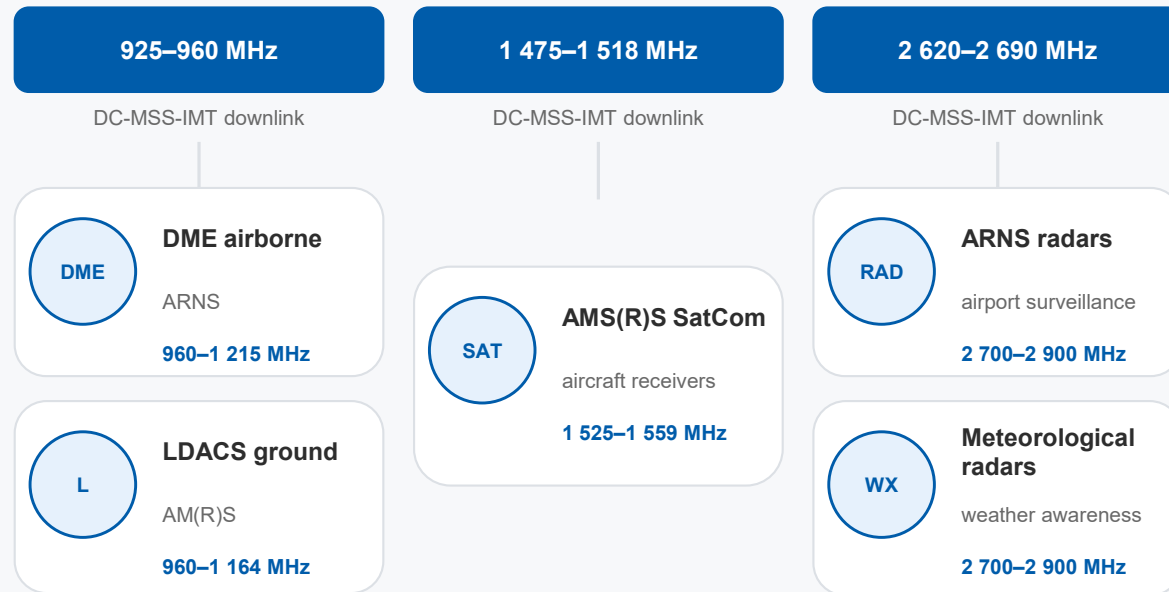
Aviation safety considerations in the adjacent bands

July 2026 WP 4C update for FSMP discussion

Presentation Overview

Aviation systems operating in the adjacent bands

DC-MSS-IMT space-to-Earth emissions near aeronautical bands



01 Background

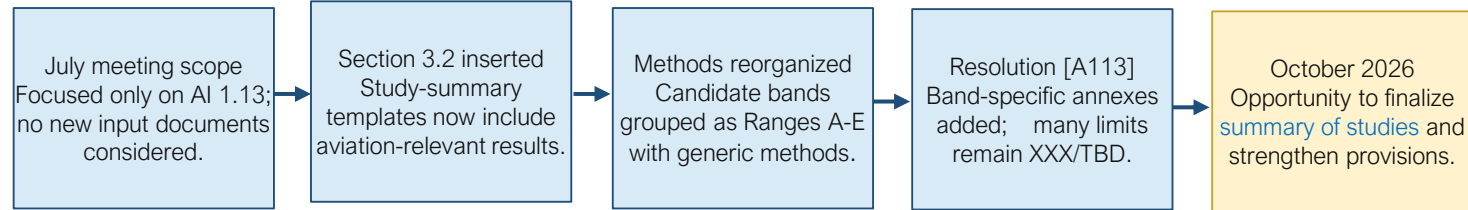
02 Impact on aviation systems

03 ICAO Position

04 Conclusion

What changed in the July 2026 WP 4C material

35th bis WP 4C meeting: CPM text progressed, but the document remains non-final.



Implication for Aviation

- ❑ The July draft now gives us a stronger basis to request explicit protection of aviation systems in CPM Section 3.2 and Resolution [A113].
- ❑ **Main issue:** Main issue: aviation study findings are increasingly visible in Section 3.2, but several still need to be translated into complete and measurable protection conditions in Resolution [A113].

Aviation-relevant adjacent-band cases now visible

The July CPM draft confirms aviation exceedances and mitigation needs; residual risks and aggregate analysis remain open.

Range	DC-MSS-IMT DL [MHz]	Victim system	July study-summary message
Range A	925 - 960	DME airborne / LDACS ground	Full 925–960 MHz exceeds; studied 925–955 MHz mitigation meets the study-derived limits with limited margin.
Range B	1 475-1 518	AMS(R)S SATCOM receivers	Mitigation protects low-gain only; high-gain remains exceeded
Range E	2 620-2 690	ARNS radars	Main-beam case remains exceeded after 2 620-2 685 MHz mitigation
Range E	2 620-2 690	Meteorological radars	I /N exceeds by 9.1 to 11.9 dB; => dynamic aggregate still needed

Interpretation

Compatibility is not automatic. It depends on :

- band-edge restrictions,
- unwanted emission limits,
- aggregate methodology.

Compatibility snapshot

How the aviation cases look after the July study-summary update.

Case	Without mitigation	Mitigation studied	Remaining concern
925-960 -> DME/LDACS	Not compatible	925-955 MHz	Passes, limited margin
1 475-1 518 -> AMS(R)S	Not compatible	1 475-1 513 MHz	High-gain still negative
2 620-2 690 -> ARNS radar	Not compatible	2 620-2 685 MHz	Main-lobe still negative
2 620-2 690 -> met radar	Not demonstrated	Dynamic aggregate pending	Per-satellite already negative

4 aviation-relevant cases

3 remain unresolved or limited after mitigation

1 passes only with small residual margin

Overall interpretation

The CPM draft text should describe compatibility as conditional and should avoid language implying that compatibility has been fully demonstrated across all adjacent-band aviation cases.

Range A: 925-960 MHz vs DME and LDACS above 960 MHz

Full-band operation exceeds aviation PFD limits; the studied guard band resolves the case with limited margin.

DC-MSS-IMT DL
925-960 MHz

Mitigation
925-955 MHz

Protected systems
DME / LDACS >960 MHz

Scenario	Const. 1	Const. 2	Status
LDACS ground	-12.8 dB	-15.8 dB	Exceedance
DME airborne	-11.8 dB	-13.6 dB	Exceedance
LDACS ground, 925-955	+3.9 dB	+1.4 dB	Passes, limited
DME airborne, 925-955	+6.2 dB	+3.4 dB	Passes

Regulatory implicationS

- ❑ Do not assume full 925-960 MHz compatibility.
- ❑ Keep 925-955 MHz restriction or equivalent PFD/OOBE limits.
- ❑ Mention ARNS DME and AM(R)S LDACS explicitly.
Examples: ARNS, including DME; AM(R)S, including LDACS.

Smallest remaining margin: +1.4 dB

Range B: 1 475-1 518 MHz vs AMS(R)S SatCom receivers

Study A : AMS(R)S aircraft receivers are the anchor

Study A explicitly considers high- and low-gain AMSS / AMS(R)S receivers on aircraft in 1 525–1 559 MHz.

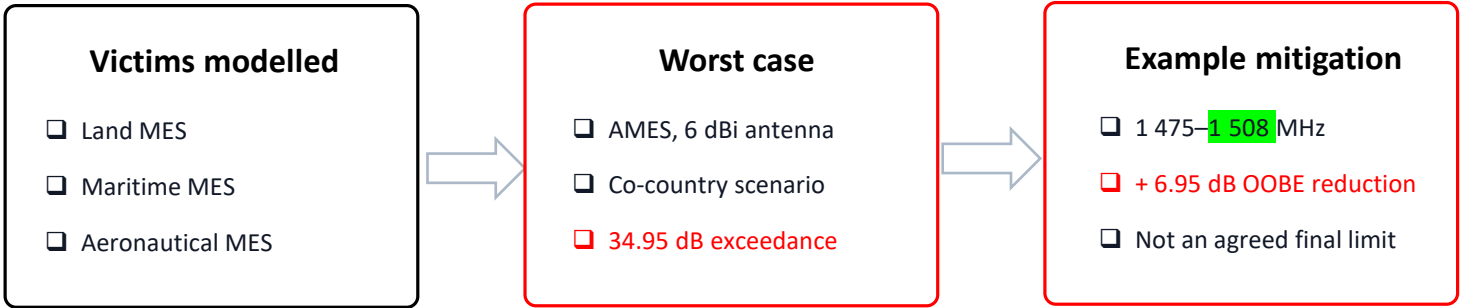
Case	Const. 1	Const. 2	Status
Low-gain, full band	-3.2 dB	-5.4 dB	Exceedance
High-gain, full band	-10.2 dB	-12.4 dB	Exceedance
Low-gain, 1 475-1 513	+2.9 dB	+0.4 dB	Passes
High-gain, 1 475-1 513	-4.1 dB	-6.6 dB	Residual exceedance

Direct aviation finding
Full-band operation exceeds both low- and high-gain AMS(R)S receiver limits.

Critical correction
1 475–1 513 MHz is not a complete solution: high-gain AMS(R)S still fails.

Study B — supporting evidence for aeronautical MES

Study B is broader than AMS(R)S: it includes land, maritime and aeronautical MES.
Its aviation value is that the aeronautical MES is the most affected terminal class.



CPM message: Study B reinforces that aeronautical SatCom receivers need explicit adjacent-band protection.

Range E: 2 620-2 690 MHz vs ARNS airport surveillance radars in 2 700–2 900 MHz

The studied 5 MHz additional band-edge separation improves the side- and back-lobe cases, but the main-beam case still exceeds the protection limit.

Radar lobe / scenario	Const. 1	Const. 2	Conclusion
Main lobe, full band	-25.5 dB	-28.2 dB	Exceedance
Side lobe, full band	+2.4 dB	-0.3 dB	Borderline
Back lobe, full band	+11.0 dB	+8.3 dB	Passes
Main lobe, 2 620-2 685	-20.8 dB	-23.3 dB	Residual exceedance
Side/back, 2 620-2 685	+7.1 / +15.7	+4.6 / +13.2	Passes

Regulatory implication

- ❑ Compatibility with ARNS radars is not demonstrated for main-beam protection.
- ❑ Removing 2 685-2 690 MHz is not sufficient by itself.
- ❑ Resolution Annex E should include aggregate PFD/OOBE limits for 2 700-2 900 MHz.

Main-lobe still negative: -20.8 / -23.3 dB

Range E: meteorological radars in 2 700-2 900 MHz

the interference from just one satellite already exceed the I/N criterion; aggregate dynamic results are still needed.

Parameter	System 3 Const. 1	System 3 Const. 2
Max possible I/N per satellite	-0.9 dB	+1.9 dB
I/N protection criterion	-10.0 dB	-10.0 dB
Margin	-9.1 dB	-11.9 dB

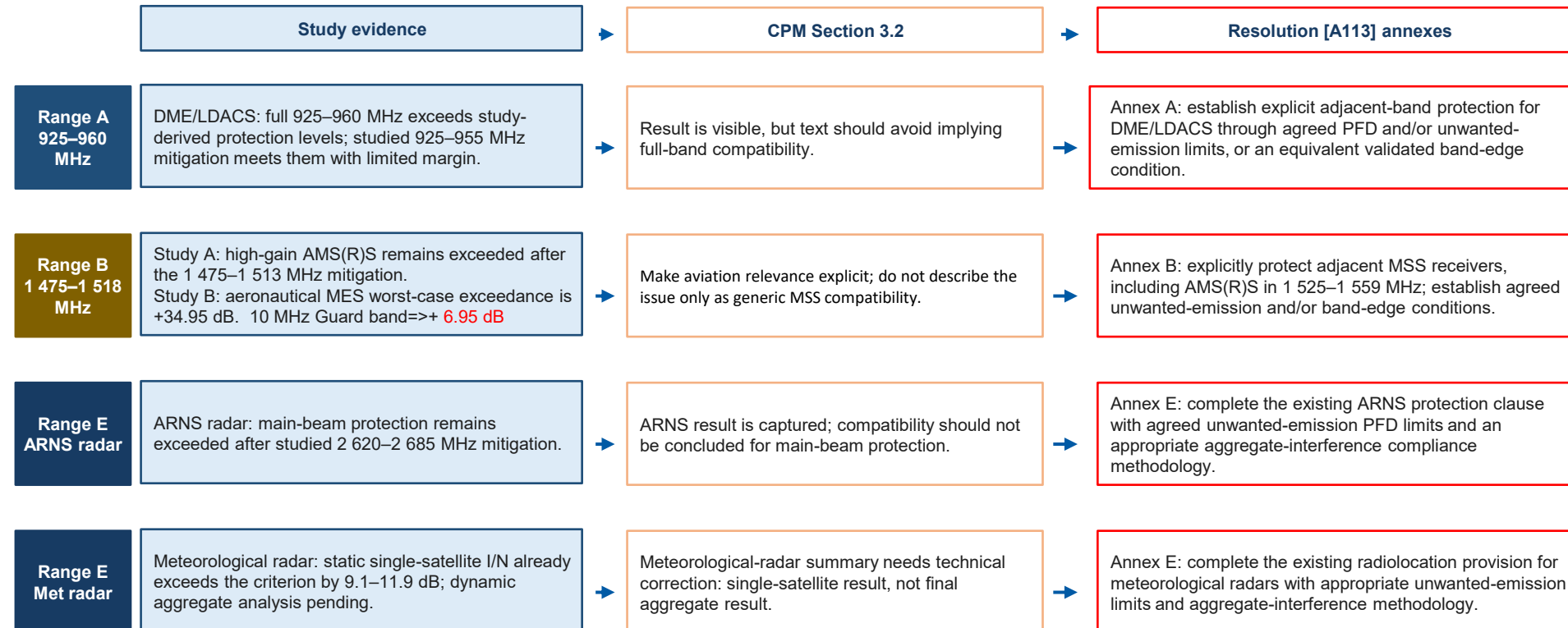
Regulatory implication

- ❑ Meteorological radar products support weather awareness used in aviation operations.
- ❑ Compatibility should not be concluded until dynamic aggregate analysis and mitigations are complete.

CPM message: Aviation protection for 2 700–2 900 MHz remains conditional and should be explicitly reflected in the CPM text and Annex E.

CPM text gap: aviation study results → regulatory provisions

Aviation results are visible in Section 3.2, but protection conditions still need to be carried into Resolution [A113] annexes.



The aviation results are now visible in CPM Section 3.2, but the wording must accurately state what has and has not been demonstrated.

Aviation request: carry Section 3.2 findings into Annex A/B/E as measurable, verifiable and enforceable protection conditions before compatibility is concluded.

ICAO position

For WRC-27 Agenda Item 1.13, ICAO:

Opposes

new MSS allocations or regulatory actions under Resolution 253 (WRC-23) that overlap frequencies used by civil aviation within 694–2 700 MHz.

Requires that adjacent-band outcomes:

- ☐ do not reduce protection of civil aviation systems operating within 694–2 700 MHz; and
- ☐ do not impose additional regulatory or technical constraints on those aviation systems.

This includes protection of primary surveillance and meteorological radars operating adjacent to the upper end of the 694–2 700 MHz range.

Conclusion

- 1 Keep aviation findings explicit and technically accurate**
DME/LDACS, aeronautical SATCOM including AMS(R)S, ARNS radars and meteorological radars should remain explicitly and accurately reflected in CPM Section 3.2.(3/1.13/3.2).
- 2 Translate required protection measures into regulatory conditions**
Where compatibility depends on band-edge separation and/or unwanted-emission reduction, reflect the necessary protection conditions in the relevant Resolution annex.
- 3 Use appropriate aggregate-interference methodology**
NGSO assessments should consider aggregate PFD or aggregate I/N, as applicable, together with time-varying satellite geometry.
- 4 Do not treat unresolved cases as compatible**
AMS(R)S high-gain and ARNS main-beam protection remain unresolved; meteorological-radar single-satellite interference already exceeds the criterion and dynamic aggregate analysis is still pending.

Thank You

