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INTERNATIONAL CIVIL AVIATION ORGANIZATION

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ICAO WRC-27 Preparatory Workshop

Agenda item 1.15: Lunar communications

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Presentation Overview

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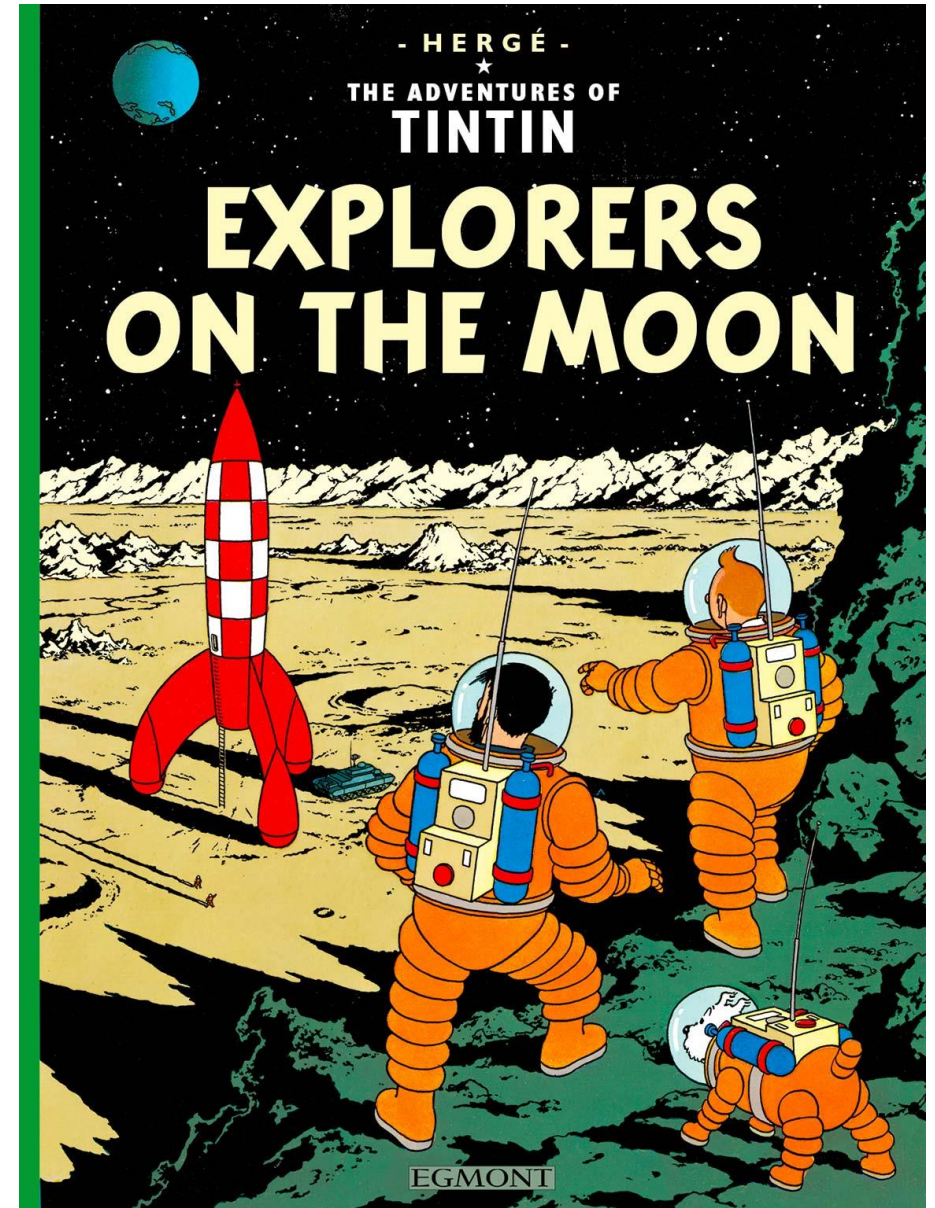
Background

56 years after Apollo 11 mission, new moon exploration projects are on-going.

Some of them plan to deploy habitation modules.

These missions requires radiocommunications solutions.

However, regulatory framework of radiocommunication at the surface of the moon does not exist



Background

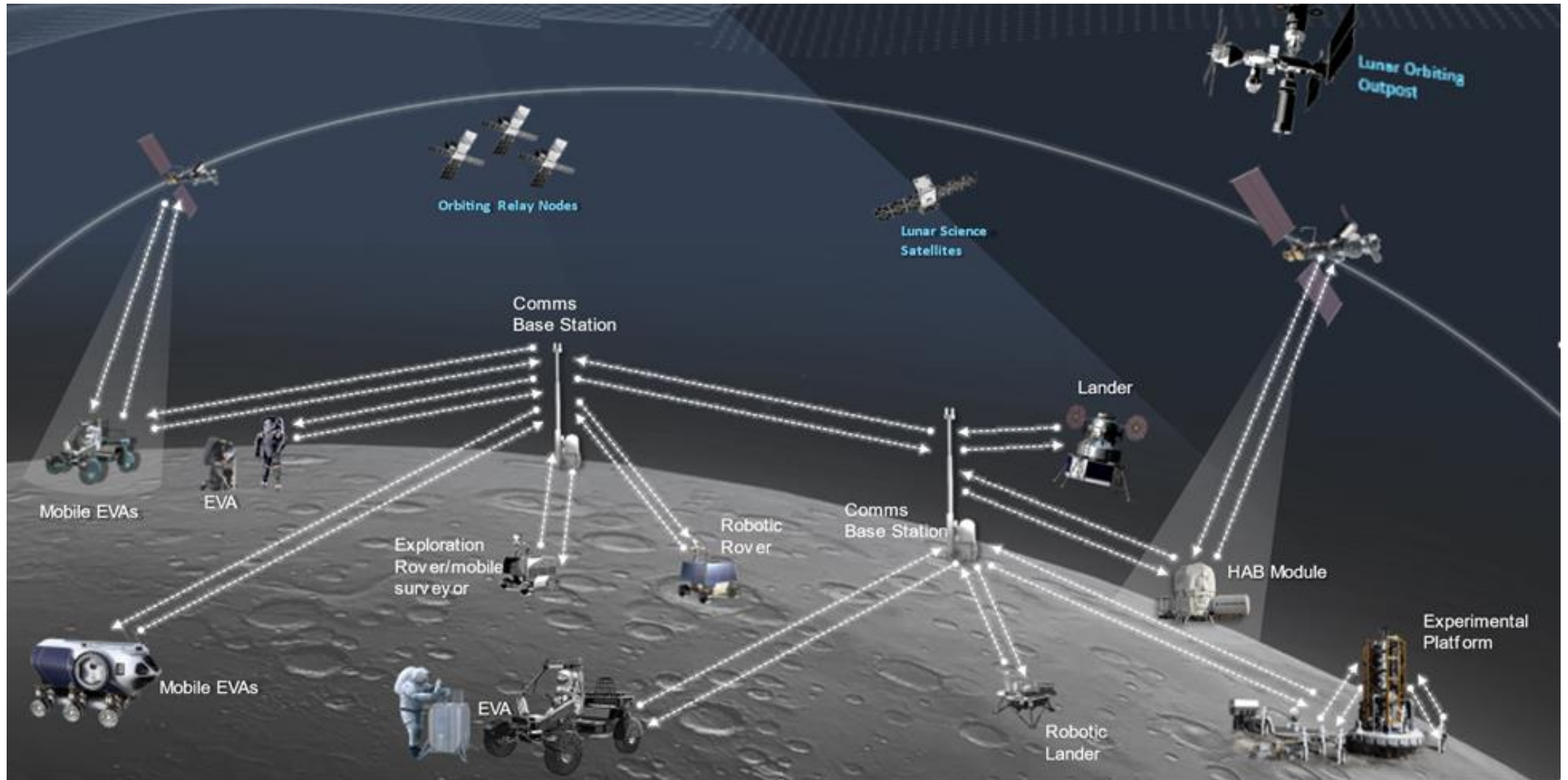
Frequency bands under consideration by ITU-R Resolution 680:

Limited to outside the shielded zone of the moon	Not limited to outside the shielded zone of the moon	
390 – 406.1 MHz	2400 – 2690 MHz	5775 – 5925 MHz
420 – 430 MHz	3500 – 3800 MHz	7190 – 7235 MHz
440 – 450 MHz	5150 – 5570 MHz	8450 – 8500 Mhz
	5570 – 5725 Mhz	25.25 – 28.35 GHz

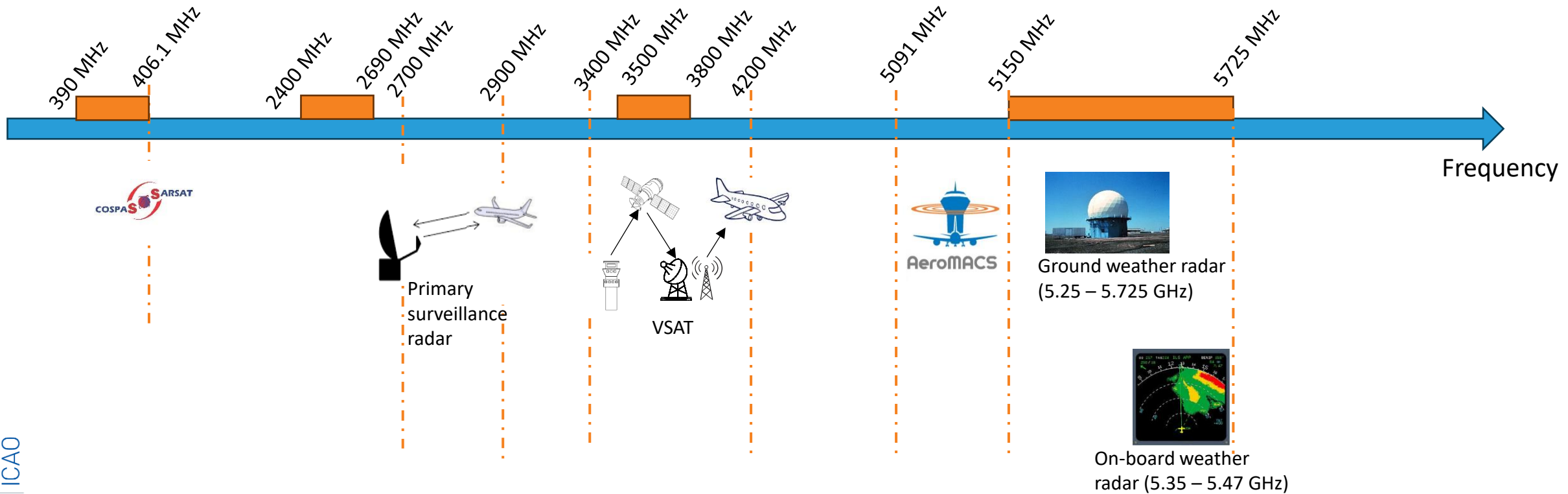
ITU-R Resolution 680 also asks for studies of potential new or modified frequency allocations and/or identifications to the SRS with appropriate regulatory provisions, for communications on the lunar surface or in lunar orbit communicating with systems on the lunar surface

Background

Lunar radiocommunication architecture



Potential issues



On-going work in ITU-R

Agenda item 1.15 is addressed by WP-7B.
Several documents are under development:

Sharing studies of space research systems for lunar operations under WRC-27 agenda item 1.15

- Studies focusing on Cospas-Sarsat show that emergency beacons on the surface of the Moon that are operated close to an astronaut's body will meet the protection criteria for COSPAS-SARSAT.
- Studies on aeronautical systems do not identify significant risk of interference

Working document towards preliminary draft CPM text for WRC-27 agenda item 1.15

- At this stage, methods to respond to this agenda item are not included in the draft CPM text

Working document toward preliminary draft new Report ITU-R SA.[FUTURE LUNAR COMMUNICATION AND SYSTEMS STUDY] - Radiocommunication needs for future lunar vicinity activities beyond space research and consideration of associated radiocommunication services and sufficiency of existing regulatory provisions

- Explains spectrum needs. 3 scenarios are identified → Humans living and performing science on a lunar-orbiting platform, Humans living and working on the Moon to support science and exploration, Other (tourism, etc)

1.15

ICAO position

To ensure that ITU-R studies appropriately account for the protection of systems used for the provision of aeronautical services, in particular those operating in the frequency ranges 2 700-2 900 MHz, 3 600-4 200 MHz, 5 350-5 470 MHz.

To ensure that the proposed methods to satisfy this agenda item would not create constraints on the aviation systems used to support the safe operation of international civil aviation.

Conclusion

This agenda item explores space research service allocations for communications at the surface of the moon and between the moon surface of moon orbit vehicles.

Several frequency bands are identified, some of which are adjacent or overlapping aeronautical frequency bands.

Although the separation should be high enough to ensure that civil aviation systems remain free from harmful interference, civil aviation community should remain careful remain protected without undue constraints.

Thank You

