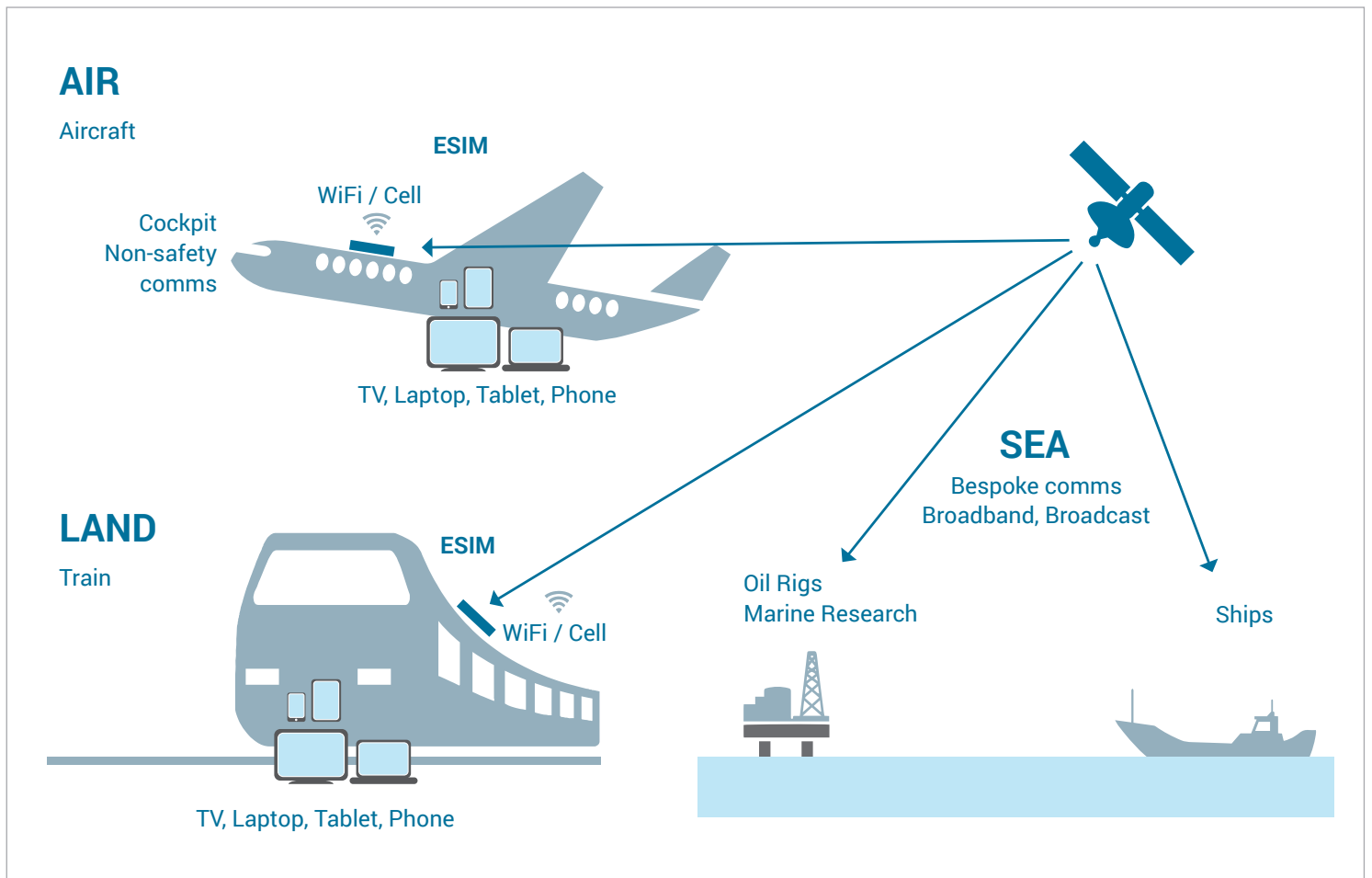


WRC-19 Agenda item 1.5: Mobile Broadband via Ka-Band Satellites

Overview: WRC-19 Agenda item 1.5 considers the use of the frequency bands 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) by earth stations in motion (ESIMs) communicating with geostationary satellite orbit (GSO) FSS space stations. This agenda item builds on the provisions adopted at WRC-15 for the operation of ESIMs communicating with GSO FSS space stations in the 29.5-30 GHz and 19.7-20.2 GHz bands. Expanding the frequency bands for ESIMs is necessary to support the rapid growth in demand for broadband communications from the global average of 67 million people¹ on the move in the air, at sea, and overland at any time. The GSC supports a regulatory environment that recognizes the ability of ESIMs to operate within GSO FSS networks on all of the spectrum they currently use through adoption of the solution developed as Method B in the CPM Report.

Background and ITU-R Studies: ITU-R studies have identified ways for ESIMs to operate compatibly with other services (both space and terrestrial) and have also led to exemplary guidelines to assist administrations wishing to authorize ESIMs on their territories. The following diagram shows how ESIMs expand the traditional FSS applications by providing truly broadband services to mobile platforms.



¹ The global population in transit is equivalent to the world's 21st largest country, the UK.



Some of the key aspects are:

- Use of ESIMs with a GSO FSS network would not change the sharing environment with other GSO FSS networks, as ESIMs would operate within the same technical envelope as existing GSO FSS networks.
- For the 17.7-19.7 GHz band (i.e. the ESIM receive band), use of ESIMs would not impact the sharing with other services (space or terrestrial) as ESIMs will not claim additional protection and there would be no change to the transmission parameters from the GSO FSS satellite to serve ESIMs.
- For the 27.5-29.5 GHz band (i.e. the ESIM transmit band), means to protect other services have been developed with some options identified in the CPM Report to be decided:
 - To address compatibility with NGSO FSS systems in frequency bands where there is no coordination requirement, off-axis e.i.r.p. density limits for ESIMs are contained in Annex 1 of the draft WRC Resolution with options for on-axis e.i.r.p. limits. Compatibility with NGSO FSS in other bands, and with NGSO MSS feeder links, would be addressed through normal satellite coordination.
 - Aeronautical ESIMs protect terrestrial services by complying with the power flux density (pfd) limits on the Earth's surface contained in Annex 2 Part 2 of the draft WRC Resolution. The "Option 1" pfd mask is supported by the GSC and many administrations. The alternative pfd mask proposed would leave ESIMs without the necessary power to communicate effectively and would over-protect terrestrial services. An altitude limit is unnecessary, as the pfd limit maintains the required protection irrespective of the aircraft altitude. Any operations that do not satisfy the pfd mask would be subject to domestic regulation.
 - For maritime ESIMs, a distance from the shore beyond which ESIMs can safely operate without interfering with terrestrial services is required (Annex 2 Part 1 of the draft WRC Resolution). The distance of 70 km is supported by the GSC and many administrations, which provides adequate protection to fixed and mobile systems operating in the same band. ESIM operation inside that distance would be coordinated with the concerned administration. Larger distances suggested by some sector members would over-protect terrestrial services.
 - For land ESIMs, administrations can address compatibility with other services domestically, and through bi-lateral agreements with neighbouring administrations.

The GSC recommends that Method B with the above referenced Options in the CPM text be adopted by WRC-19. This regulatory solution will provide ESIM operators with access to existing and planned GSO FSS systems to support the growing demand from travellers for broadband connectivity on the move, and results in rational and efficient use of the radio spectrum resource. Existing services will be protected from possible interference.

Note: Iridium does not support the GSC position on ESIM use of 19.4-19.6 GHz and 29.1-29.3 GHz.