Worldwide allocations around 1.4 GHz for Little LEO feeder links

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The World Radiocommunication Conference (WRC-03) presents an important opportunity to help bridge the digital divide with low-cost mobile data communications. The WRC-03 Agenda item 1.16 will consider allocations on a worldwide basis for feeder links in bands around 1.4 GHz to the non-geostationary mobile-satellite service (non-GSO MSS) also known as "Little LEO", with service links operating below 1GHz.

Current spectrum is inadequate

The spectrum allocated to non-GSO MSS systems so far is inadequate to allow the industry to develop in the market and to accommodate the needs of those systems submitted to ITU for advance publication and coordination. A total of only 1.525 MHz (space-to Earth) and 1.9 MHz (Earth-to-space) are currently allocated on a worldwide primary basis to the Little LEO industry.

There have been no additional international allocations for non-GSO MSS systems since the 1992 World Administrative Radio Conference (WARC-92). The initial allocations at WARC-92 included spectrum in the 137-138 MHz, 148-149.9 MHz, 149.9-150.05 MHz and 400.15-401 MHz bands heavily occupied either by terrestrial commercial users or by other satellite systems.

An important point to consider is that each non-GSO MSS system having dedicated feeder link spectrum, on a global basis, for both uplink and downlink communications would make additional service link spectrum available within the present allocations to non-GSO MSS below 1GHz.

Significant technical work done

There is a long history of evolving studies on frequency sharing between non-GSO MSS feeder link systems near 1.4 GHz and existing and currently planned systems that operate within the present allocations. In fact, since 1996, sharing studies of the bands around 1.4 GHz have been ongoing with the ITU Radiocommunication Sector (ITU-R) through Working Parties 7C, 7D and 8D.*

Over the past years of these ITU-R studies of the operational and technical means to facilitate sharing between non-GSO MSS feeder links and existing and currently planned services, compatibility issues were identified, but then they were resolved. These bands were put forth internationally for non-GSO MSS systems and are now the focus on Agenda item 1.16 at WRC-03. In summary:

- Non-GSO MSS feeder uplinks in the 1390-1393 MHz band can operate with the Earth-exploration satellite service – EESS – (passive) in nearby bands.
- Non-GSO MSS feeder uplinks in the 1390-1393 MHz band can operate with other services (i.e. radio astronomy, radiolocation, fixed and mobile).
- Non-GSO MSS feeder down links in the 1429-1432 MHz band can operate with EESS (passive) in nearby bands.
- Non-GSO MSS feeder down links in the 1429-1432 MHz band can operate with the radio astronomy service in nearby bands.
- Non-GSO MSS feeder down links in the 1429-1432 MHz band can operate with the fixed services in the same nearby bands.

The propagation characteristics of these bands around 1.4 GHz make them technically suitable for feeder link operations. Also, these frequencies are not yet heavily occupied in some countries by other services that are highly sensitive to potential interference, thus they are available for global allocation.

Bridging the digital divide

Little LEO (non-GSO MSS) applications include mobile data messaging, data acquisition, and asset tracking. The market focus includes mass markets (extending the reach of terrestrial wireless networks) and industry markets (transportation, utilities, construction, oil and gas, and automobile industries).

These services can help to close the digital divide with many socio-economic benefits that accompany new technologies. For example, non-GSO MSS systems will create instant infrastructures, serve low and high density areas at the same price points, and deliver reliable, flexible, and easily expandable and reconfigurable services. Applications are "scalable" from one to millions of user terminals.

Not only will Little Leo systems benefit from worldwide allocations around 1.4 GHz for feeder links (Agenda item 1.16), but there will also be new business opportunities for service providers, user terminal manufacturers, application developers and value-added resellers of digital data services.

Most importantly, Agenda item 1.16 is a bridge to crossing the digital divide to make low-cost data services accessible to all. It is a bridge to connect with data communications the 1.5 million villages around the world still lacking telephone service. It is a bridge to close the gaps in terrestrial services with seamless satellite services. It is a bridge to business beyond boundaries.