



Resolution SFCG 24-1R1

**INTERFERENCE MITIGATION TECHNIQUES FOR FUTURE SYSTEMS
PLANNING TO OPERATE IN THE 2200-2290 MHZ BAND**

The SFCG

CONSIDERING

- a) that interference in the 2200-2290 MHz band can occur to earth stations supporting direct space-Earth links as well as space-to-space systems using data relay satellites;
- b) that interference may be caused by other satellites as well as terrestrial emitters;
- c) that the band 2200-2290 MHz is presently congested and interference among users often exceeds the levels for protection in relevant ITU-R Recommendations;
- d) that the number of systems using the 2200-2290 MHz band is expected to continue to increase in the future causing a corresponding increase in interference levels;
- e) that systems with moderate link margins are better able to tolerate interference levels in the band than those with low link margins;
- f) that use of large earth station antennas with high gains and low sidelobe levels reduces the impact of potential interference;
- g) that the use of multiple ground stations that are simultaneously in view of the spacecraft can offer downlink redundancy and avoid loss of data during periods of interference;
- h) that future increases in interference in the band can be reduced by ensuring that future spacecraft transmit only when in view of their cooperating earth stations;
- i) that future interference in the band can also be reduced by selection of the minimum bandwidth necessary to accomplish the intended mission;
- j) that most space-to Earth systems currently operating in the band use significantly less than 6 MHz;

- k) that most space-to-space systems currently operating in the band use bandwidths no more than 6 MHz;
- l) that larger bandwidths than the above do not promote homogeneity and tend to increase future congestion in the band;
- m) that Rec. ITU-R SA.1154 concludes that sharing with high density mobile services is not feasible and should be avoided.
- n) that data relay satellites are compatible with low density mobile service systems in this band and that Earth stations are incompatible with low density mobile service systems unless sufficient RF isolation exists between the mobile systems and the earth station.
- o) that sufficient earth station isolation from low density mobile systems may not be feasible in all cases.

NOTING

- a) that this frequency band is also heavily used by entities other than SFCG member agencies;
- b) that several frequency bands are available as alternatives to the band 2200-2290 MHz;
- c) that the band 25.5-27.0 GHz has the advantages of allocation to the Space Research and Earth Exploration satellite services in both space-to-Earth and space-to-space direction and offers a total bandwidth of 1.5 GHz;
- d) that the use of data relay satellites may reduce the number of earth stations requiring protection from mobile interference.
- e) that ITU RR No. **5.391** precludes the deployment of high density mobile service systems in the 2200-2290 MHz band.

RESOLVES

1. that systems developed for use in the 2200-2290 MHz band not transmit when beyond view of their cooperating earth stations or when beyond view of their cooperating data relay systems;
2. that systems using this band be designed to minimize their bandwidths to reduce the potential interference to other systems in the band and that, whenever practical, bandwidths should not exceed 6 MHz, to reduce future congestion in the band;
3. that due consideration be given to interference mitigation techniques including earth station geographical diversity, increased earth station antenna gain enhancing the link margin, reduced earth station antenna sidelobe levels, earth station isolation from mobile

links and the use of data relay satellites, if available, to augment and replace earth stations;

4. that other bands, like the band 25.5-27.0 GHz, be considered for high data rate systems.