

## About EPFD Limits:

### The Outdated Regulations Governing Modern Satellite Systems

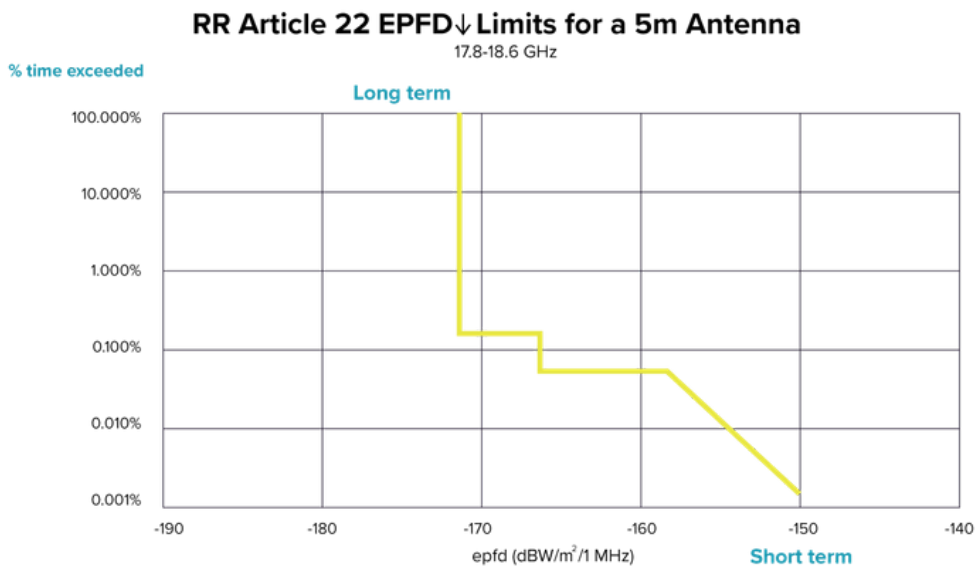
#### What are EPFD limits?

Equivalent Power Flux Density (EPFD) limits are a regulatory metric adopted by the International Telecommunication Union (ITU) in 2000 and outlined in Article 22 of the Radio Regulations. They set hard limits on the strength of radio emissions from non-geostationary orbit (NGSO) satellite systems to geostationary orbit (GSO) networks in certain frequencies. EPFD limits were established to protect incumbent GSO networks from harmful interference from NGSO systems. The limits were based on the characteristics of GSO networks from the 1990s and theoretical NGSO systems in the C, Ku and Ka bands.

EPFD describes the aggregate power per unit area that NGSO systems can produce into GSO networks over time. These limits apply to:

- **Downlink** — from NGSO space stations to GSO earth stations
- **Uplink** — from NGSO earth stations to GSO space stations
- **Inter-Satellite** — from NGSO space stations to GSO space stations

The chart below shows the maximum power that an NGSO system's space stations can produce into a GSO space station for different durations. (This can be found in Table 22-1B of Article 22.)

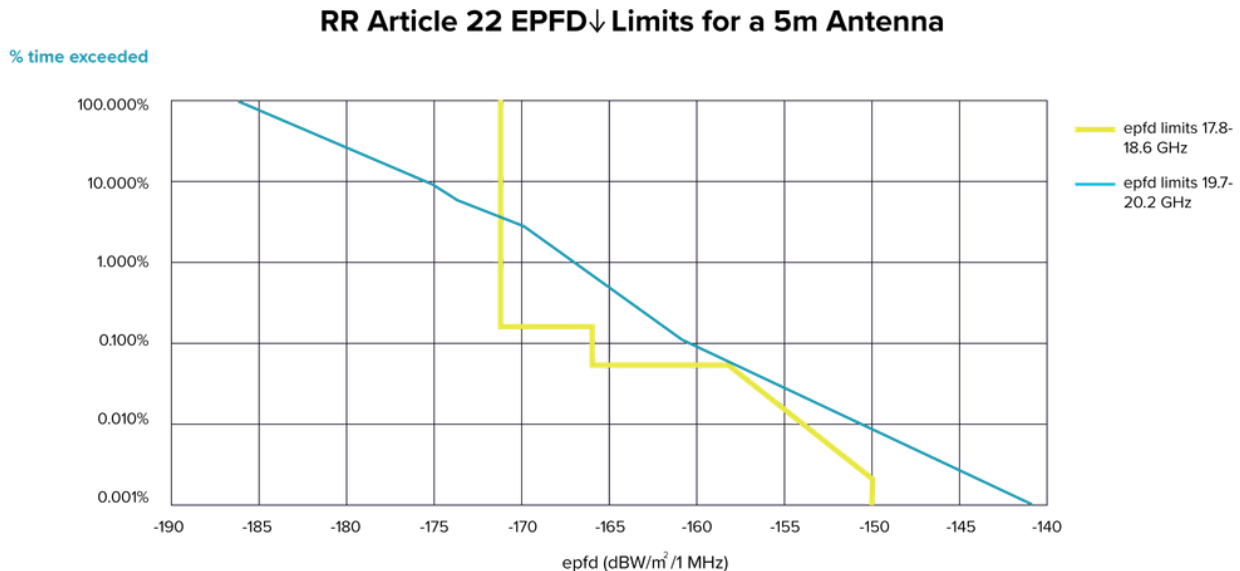


NGSO systems can produce higher power levels for very short periods, but in the long term, they are constrained to much lower power levels.

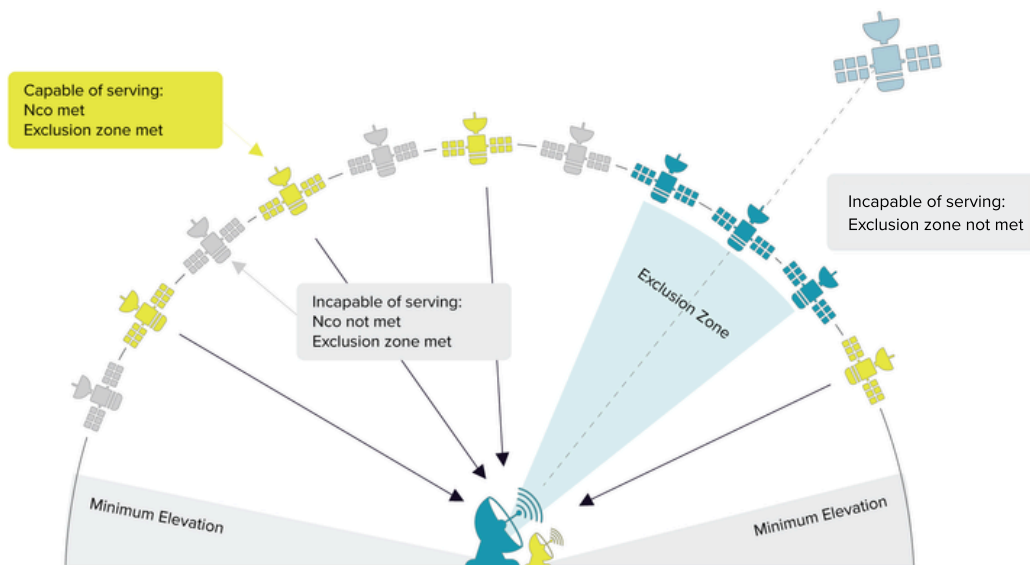
## What technical challenges do EPFD limits pose?

In practice, EPFD limits are simply too conservative for today's modern satellite technologies. They were developed long before today's NSGO systems even launched and were based on a compromise reached in 2000, which led to discrepancies that can't be explained today.

For example, there is a 15 dB difference between the long-term EPFD limits in the lower Ka band (17.8-18.6 GHz) and the upper Ka band (19.7-20.2 GHz), which apply to the same GSO earth station antenna size of 5 meters. Studies have shown that there is no technical justification for maintaining the difference in limits for the upper Ka band.



EPFD limits can necessitate large exclusion zones, which reduce the coverage area that an individual satellite can serve. These limits also reduce the number of satellites that NSGO systems can use simultaneously to serve a particular area. This poses real on-the-ground consequences for NSGOs: lower capacity, higher costs and higher barriers for new entrants.



## Can EPFD limits be safely modernized?

The ITU is currently studying EPFD limits, and all countries will decide whether to update them at the next major conference in 2027 (WRC-27). The evidence shows that EPFD limits can be safely modernized to reflect current technology and modern spectrum management, while continuing to protect all satellite operators from unacceptable interference.