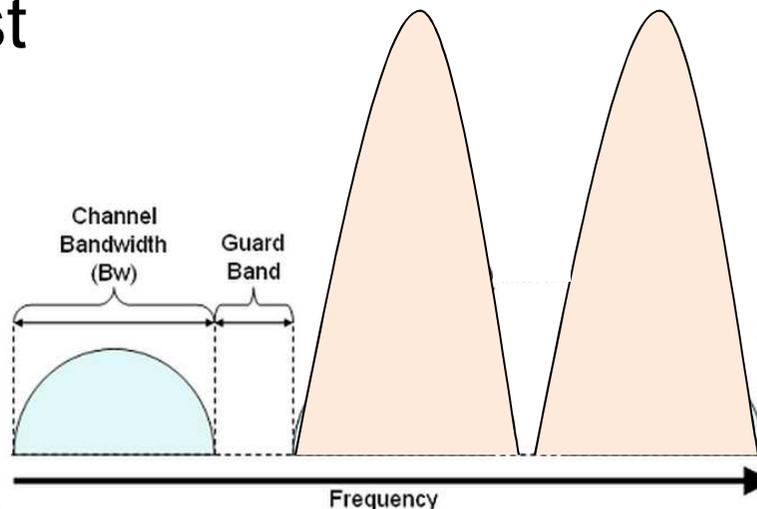




Adjacent Band Interference Concerns

Separating different radio types

- As described in previous sessions, the Radio Regulations divide radio spectrum into separate "allocations" to reduce the potential for interference between different types of radio use
 - eg GNSS and TV have separate frequencies
- To minimize interference, "guard bands" between very different services have been used in the past



Maximizing spectrum efficiency

- However, because spectrum is scarce and valuable, guard bands are avoided today
- Instead regulators work at the ITU to identify service types that can either work together in the same bands or with minimal frequency separation
- An example of services that can sometimes use the **same bands** are point-to-point links and point-to-satellite links (fixed and fixed-satellite services in ITU speak), which use highly directional radio beams (dish antennas)



What is an adjacent band?

- Two frequency bands next to each other are called "**adjacent bands**"
- Radio Regulation services allocated in adjacent bands have characteristics that allow them to be **compatible**
- compatible adjacent band services are typically similar, eg ground to Earth satellite emissions
- services that are incompatible and therefore not suitable to be in adjacent bands are typically very different in nature
 - eg TV (very high power) and mobile phone (high power) networks



Being a 'good neighbour'

- Adjacent band compatibility means that the emissions of radio services in adjacent bands do not cause unacceptable interference to each other – they are good neighbours
- How do you know different services will be good neighbours?
- Ask the ITU!
- ITU Member State experts (working within ITU **Working Parties**) consider in detail how two different services would work as neighbours



Adjacent band compatibility studies

- ANY proposal to change the Radio Regulations to make a new allocation for a radio service is always studied carefully to assess the impacts on existing services
- the studies will consider the parameters for each service as well as how they are used, or would be used
 - eg, power levels, antenna types/direction, receiver sensitivity, frequency characteristics, indoor/outdoor, fixed position or mobile
 - these are built into a model to determine the degree to which the two services interfere with each other
 - depending on results, the proposed allocation may or may not be compatible with the existing service



When it can go wrong

- If new allocations/services are introduced:
 - without compatibility studies being carried out
 - or if incorrect parameters are used
 - or assumptions about existing usage are incorrect⇒ then **interference is a real risk!**
- this could happen if a country decides to introduce new services without proper studies
- this is especially risky for GNSS, with such low level signals:
 - spectrum occupancy measurements are unlikely to show the presence of GNSS signals
 - if other radio services then use nearby frequencies⇒ **interference to GNSS is a real risk!**

