

ITU/WMO SEMINAR

Impact of RF interference on
spectrum use for meteorology
Meteorological radars in 5 GHz

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Background (1)

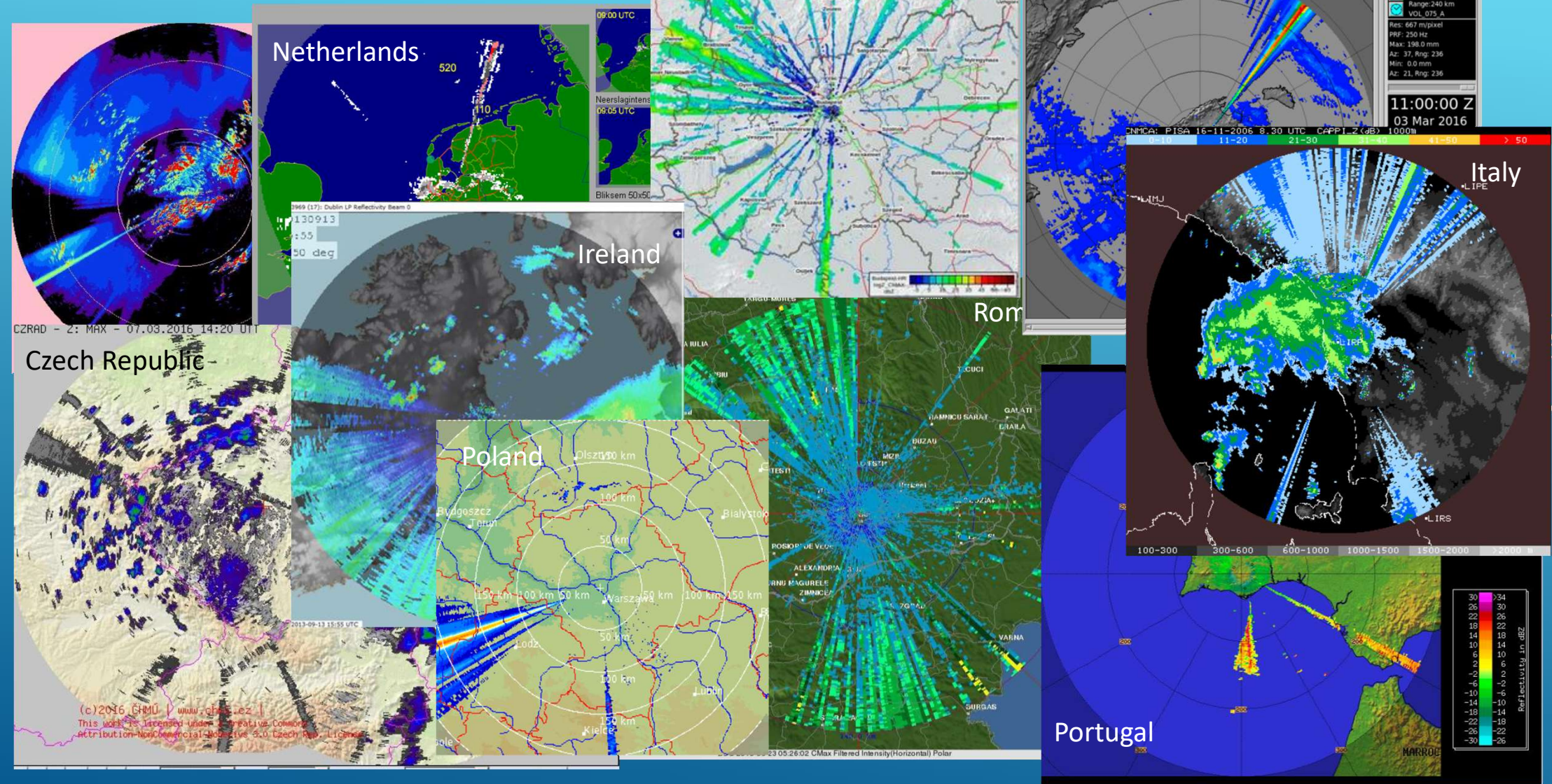
- RLAN 5 GHz (WIFI) were authorized in the 5 GHz range (5150-5350 MHz and 5470-5725 MHz) following a decision made at WRC-03.
- This authorization has been made under certain technical conditions set-up in WRC Resolution 229.
- Among other conditions (eirp limits, ...), this allocation was associated with an obligation to implement a **Dynamic Frequency Selection (DFS)** mechanism to ensure protection of radars operating in the 5250-5350 MHz and 5470-5725 MHz bands, including weather radars in the 5600-5650 MHz band
- Under DFS, RLANs have to monitor their channel and, if they detect a radar signal, they have to move to another channel.

Background (2)

- The DFS specifications include a number of parameters, in particular a minimum detection signal (-64dBm) and a large variety of radar signals to detect.
- The general specifications of DFS are given in Recommendation ITU-R M.1652.
- Detailed specifications are given in ETSI standard EN 301 893.
- On the paper, on a theoretical basis, everything sounds fine

BUT...

Some years later...



RLAN 5 GHz interference to radars

First interference cases occurred in 2006, mainly in Eastern Europe

Reason => ETSI standard EN 301 893 not covering the specificities of meteorological radars...

Report ITU-R M.2115-1 describes the new releases of the ETSI standard elaborated In 2008

In 2011, due to the lack of improvement the issue was raised to European Authorities:

- A market surveillance campaign involving 21 European countries was performed
- Different products were investigated and the results show non compliant equipment (DFS not implemented, possibility to deactivate DFS by the user, ...)

Overall, this campaign showed that **more than 70%** of the products on the market were not **compliant !!**

And now ?

In Europe:

- interference to meteorological radars are continuously increasing
- Despite adoption of Reports, action plan or “list of possible options that could help to alleviate the issue”, nothing has changed over years ...
- **More than 90%** of C-band weather radars are suffering interferences every year

The only mitigation technique, already done in some countries, is to move to the 5350–5470 MHz

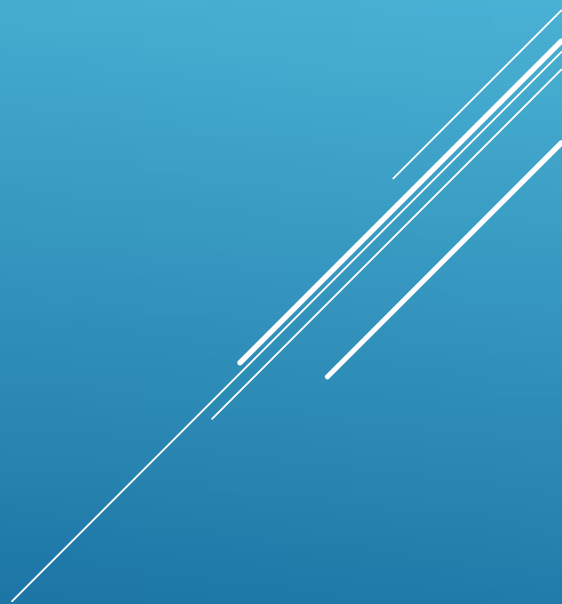
- ✓ **associated cost**
- ✓ **limited by existing usage**

Conclusions

Current situation **shows** :

- a high difficulty, not to say the impossibility, **to ensure the protection of weather radars from RLAN devices deployment in the 5 GHz,**
- **a significant risk** for meteorological community losing **the 5600-5650 MHz frequency band.** A risk coming from stations operating under mobile service allocation which shall not claim protection from nor cause harmful interference to radiolocation service (see RR. **5.450A** & **5.43A**),
- **that the only efficient mitigation technique** “to move meteorological radars in the 5350-5470 MHz” could put at risk the existing services and their development such as aeronautical radionavigation and Earth exploration satellite (active) services,
- **obstacles** to any future development of meteorological radar which could improve the efficient spectrum use (e.g. solid state technology), due to the impact on existing RLAN applications usage,
- the need in the future **to avoid deployment of mass-market unlicensed type radio application** in frequency bands of interest for meteorological or scientific communities.

THANK YOU.

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