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**Summary of discussions based on the replies of CEPT administrations to the questionnaire on interference cases caused by WAS/RLAN in meteorological radars operating in the 5600 - 5650 MHz frequency range**

37 CEPT administrations responded to the questionnaire, 24 of which reported around 554 interference cases of WAS/RLAN equipment into meteorological radars, confirming the findings of the elements provided by EUMETNET for the period 2015 - 2016.

The outcome of the questionnaire confirmed an increase of interference cases from WAS/RLAN equipment into meteorological radars (operating in the band 5600 - 5650 MHz) and the level of non-compliance of RLAN equipment.

The replies submitted outline areas between WAS/RLAN equipment and meteorological radars ranging from hundred meters up to 181 km.

Interference from WAS/RLAN equipment towards meteorological radars almost exclusively originates from equipment in fixed outdoor installations using directive antennas.

Interference takes place when the WAS/RLAN equipment is operated co-frequency. There are two types of cases: first when the whole bandwidth of the interfering WAS/RLAN was within the radar band. Secondly, when just a part of the bandwidth of the WAS/RLAN equipment was within the radar operational frequency band. This is also verified by the indications given by the CEPT administrations about the radar and WAS/RLAN operating frequencies which were observed for the reported interference cases. The operating channel bandwidth of the WAS/RLAN equipment in most cases was either 20 MHz or 40 MHz.

The answers have been mixed regarding the question whether the DFS mechanism of the WAS/RLAN equipment was inactive. The DFS mechanism was either active, inactive or inoperative and the provided information does not allow any conclusion whether the WAS/RLAN equipment was sometimes operated at higher emission levels than permitted under the current regulation, though interference is in most cases caused by equipment using directional antennas, even often having high antenna gain. Several administrations experienced both: interference cases with the DFS mechanism active or inactive/inoperative.

Interference cases are for the most of it solved by reconfiguration of the WAS/RLAN equipment, e.g. change of operating channel, DFS activation, rebooting or firmware/software upgrades/removal of equipment malfunction. Some of these actions are only possible because some WAS/RLAN equipment seem to still allow to directly or indirectly accessing the settings of the equipment controlling the spectrum access, e.g. DFS activation/deactivation.

There were a considerable number of short-term interference cases according to the reporting but most administrations have not included them in this total number of cases, having therefore only reported long-term interferences. This exclusion could explain some differences among the replies of CEPT administrations. The reason for some administrations of not counting short-term interference cases in their summary is that either they were not reported to administrations, or because they disappeared between the moment where they were identified and reported to the administration and the moment in which administrations could identify their source.

FM22 discussed short-term interference cases and concluded that, when identified, these short-term interference cases were mainly caused by emissions of end-user outdoor stations, while long-term interferences were mainly caused by emissions from RLAN access points used for infrastructure purposes. Nevertheless, FM22 noted that the interference potential of the end-user outdoor stations is in most cases similar to the access point equipment. Other cause of short-term interference could be due to other RLAN usage (i.e. home boxes, end-user connectivity, etc.) but at this stage no evidence of such case has been reported in Europe.

Another difference between the replies from CEPT administrations relates to the number of reported cases that can somehow be explained by the fact that some countries have a more developed wired infrastructure that doesn’t require additional WAS/RLAN deployment for ensuring internet access.

From the replies submitted it was also identified that more interference cases were reported in areas where meteorological radars are located in the proximity of urban areas.

Some administrations pointed out that a change in the sensitivity of the meteorological radars may solve some of the interference cases, nevertheless WG FM agreed that changes on the sensitivity of radar to resolve interference cases are not an option, as the main purpose of operation of meteorological radars is linked to a high sensitivity. Without such changes conducted at the meteorological radar side, the real number of interference cases would be higher.

In their summaries, it could be observed that, in solving interference cases, most administrations did not check the version of ETSI EN 301 893 to which compliance of the equipment was declared.

In few other cases, interfering RLAN equipment was declared to be in compliance with the harmonised standard ETSI EN 301 893 versions V1.5.1, V1.6.1, 1.7.1 and V1.8.1. This also reflects the difficulty of administrations to verify compliance of RLAN equipment which are assumed to be compliant with different versions of the harmonised standard depending on the date the equipment was put onto market. Also, depending on the date the equipment was put on the market, the applicable rules for market surveillance may be those from RED or R&TTE Directive.

Administrations in FM22 highlighted their high difficulty to verify from air measurements different RLAN parameters such as DFS, radiated power, etc.

ECC Report 192 indicates that it should not be allowed that non-compliant equipment is operated or remains in use and no effort should be made to solve the interference case by re-configuring the WAS/RLAN equipment to a different channel, or by re-enabling DFS again (where it was disabled), or by reducing the output power of RLAN access points or user equipment. Nevertheless, some administrations pointed out that in monitoring activities intended to resolve an interference case, a change of frequency, activation of DFS or a reduction of the transmitted power of RLAN equipment could resolve the interference situation in a fast manner without the need of entering into legal procedures with the involved RLAN users.

WG FM recognises that, according to the Radio Equipment Directive there is no separation between the hardware and the software of radio equipment. Nevertheless, it was acknowledged that in many cases a change of the software (firmware) could make the radio equipment non-compliant. This is due to the fact that many RLAN equipment are equipped with flash memory, so their firmware can be modified allowing options that deactivate the DFS or increase the output power in order to enhance the coverage or increase the throughput.

Administrations in WG FM also recognise that the responsibility for non–compliant equipment could be manifold, including equipment manufacturers, software developers different from the manufacturer that provide alternative firmware, service providers and network operators and end consumers which could include individuals, local authorities, businesses, etc. It is therefore important to raise awareness among these many different stakeholders of the importance of respecting the regulation and compliance standards, of their respective responsibility if an interference occurs or if a materiel is non-compliant, in order to effectively assess a solution that could prevent these interference situations in a stable manner, and not only by applying repressive measures such as shutting down services and issuing fines.

The ECO summary with more detailed information about the reported interference cases is in   
doc. [FM(17)144rev2](https://cept.org/ecc/groups/ecc/wg-fm/client/meeting-documents/file-history/?fid=38632).

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