European Radiocommunications Committee (ERC)
within the European Conference of Postal and Telecommunications Administrations (CEPT)

FREQUENCIES FOR WIND PROFILER RADARS

Lisbon, February 1991

Reports are being issued from time to time by the European Radiocommunications Committee (ERC) of CEPT to inform industry, operators, users and other interested parties of the work in hand, provisional conclusions and future activities in specific areas of radio frequency management. Such Reports give more details than is normally possible in a Recommendation and allow an opportunity for comment to be made on the work carried out so far. In most cases, it would be hoped that a formal CEPT Recommendation could be issued on the subject of the Report in due course, taking into consideration any comments received on the Report.

Reports are formally approved by, and issued in the name of, the Committee itself. In general the detailed preparation of Reports, and further work on the subject, will be done by Working Groups or Project Teams. Thus, any reference in the Reports to the ERC should be taken to include the whole framework of the ERC, including its Working Groups, Project Teams, etc.

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FREQUENCIES FOR WIND PROFILER RADARS

1. INTRODUCTION

The ERC has studied the frequency allocation questions including the sharing for the wind profiler radars. Also the results from the recent CCIR studies were taken into account.

Wind profilers for meteorological purposes are high power radars and therefore they should operate in the frequency bands allocated to the radiolocation services.

2. FREQUENCY BANDS CONSIDERED FOR 400 MHz WIND PROFILER RADARS

In the 400 MHz band the only band allocated for the radiolocation service on a primary basis in Region 1 is the band 430 MHz - 440 MHz. This band is, however, shared with the amateur service on a primary basis and with other types of radiolocation systems including the airborne radars. Additionally, in a number of countries a part of this band is also used by the mobile and fixed services.

3. SHARING CONSIDERATIONS FOR 400 MHz WIND PROFILER RADARS

(a) Sharing in the band 401 MHz - 406 MHz

This band is allocated internationally to the Meteorological Aids service. Experimental wind profilers have operated in this band as Meteorological Aids. However, the adjacent band (406.0 MHz - 406.1 MHz) is used for low power satellite emergency position indicating radio beacons (e.g. COSPAS-SARSAT satellites).

The CCIR IWP 8/15 at its recent meeting studied the compatibility problems of operating wind profilers and the distress and safety service in these adjacent bands. It concluded that such operation was not possible.

It is further to be noted that RR No. N 3067 prohibits any emission capable of causing harmful interference to distress, alarm, urgency or safety communications in the band 406.0 MHz - 406.1 MHz.

(b) Sharing in the band 430 MHz - 440 MHz

Based on the studies performed within ERC it was concluded that sharing with the wind profiler radars and other terrestrial radio services at 400 MHz is not possible and in adjacent bands geographical separation would be required. The sharing constraints can, however. be relieved with proper site shielding (e.g. siting the radars in depressions in the ground). This method is applicable only on a case by case basis in national frequency allocation considerations. In considering sharing with terrestrial services, the site shielding principle can, of course, on a national level be applied to other frequency bands around 400 MHz.

According to the report from CCIR IWP 8/15 sharing with the amateur and terrestrial radiolocation services may require separation distances of 60 km and 120 km respectively.

Concerning sharing between airborne radars (principally radio altimeters) and amateur satellite receivers it was concluded by the CCIR IWP 8/15 report that the frequencies chosen for wind profiler radars need to be substantially offset from those used by airborne radars and receivers on amateur-satellite spacecrafts to avoid interference.

4. SHARING CONSIDERATIONS FOR 50 MHz AND 1000 MHz WIND PROFILER RADARS

For wind profiler radars at 50 MHz and 1000 MHz no relevant material has yet been supplied and hence the ERC has not yet carried out any sharing studies.

On a national level the site shielding principle on a case by case basis is applicable also to frequency bands around 50 MHz and 1000 MHz.

CCIR IWP 8/15 concluded that wind profiler meteorological radars should not be accommodated in the 960 MHz - 1215 MHz aeronautical radionavigation band, unless studies prove that sharing is possible with aeronautical radionavigation.

5. CONCLUSION

Due to the sharing constraints the band 430 MHz - 440 MHz cannot be used without national co-ordination. Therefore, it seems that it is not possible in Europe to find a harmonised frequency sub-band within 430 MHz - 440 MHz for the wind profiler radar application

This conclusion applies in general to the 400 MHz band.

Therefore, it is concluded that for the time being the frequency allocation for wind profiler radars can only be solved nationally on a case by case basis. This principle also applies to wind profiler radars at 50 MHz and 1000 MHz. Whilst recognising that this approach is far from ideal and may not be possible in some countries, until further work is done on the technical development of wind profiler radars it offers the only possible solution in the meantime.

The ERC will continue to follow the technical development of the wind profiler radars and the on-going CCIR work as well as any outcome of the WARC 92 deliberations on this item and, if needed, is prepared to reconsider the frequency allocation questions. Those concerned with the development of wind profiler radars are urged to take into account the problems highlighted in this Report in order to work towards a more satisfactory solution.

In particular it is necessary to improve the spectrum efficiency of wind profiler radars and the directivity of their antennas.