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**COMMISSION FOR INSTRUMENT AND
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*OPAG-SURFACE***

**EXPERT TEAM ON REMOTE SENSING UPPER-AIR
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**COMPLEMENTARY USE OF MODERN DOPPLER RADARS AND PROFILERS
IN THE UPPER-AIR NETWORK**

Guidance material on operational aspects of wind profilers

(Submitted by the Dirk A.M. Engelbart, Lindenberg, GERMANY)

Summary and purpose of document

This document contains a summary of the existing IOM-79 report on
"Operational aspects of wind profiler radar" for RSUAT&T.

Action proposed

The meeting is invited to take the IOM-79 report into account in discussion under agenda item 4 and 7.

Summary of the IOM-79 Report No. 79

prepared by

J. Dibbern, D. Engelbart, U. Görsdorf, N. Latham, V. Lehmann, J. Nash, T. Oakley, H. Richner, and H. Steinhagen on “Operational Aspects of Wind Profiler Radars”

In Europe, networking of wind profiler radars (WPR) had been co-ordinated by two subsequent COST actions (COST-74 and COST-76). These COST actions had focussed special interest in particular on operational aspects of this aerological sounding technique.

One of the major outcomes of the COST actions were the development of a European WPR network between NMHSs', research institutes, and universities, who operationally send their data to the UK MetOffice, where a network hub and an Internet display had been realized.

After conclusion of COST-76, the Council of the European Meteorological Services Network (EUMETNET) established the wind profiler programme WINPROF to enable continuation of the operational network. The outcomes of the overall COST action COST-76 has been summarized in a comprehensive final report, which had been published by the European Commission in Nov. 2001 (ISBN-92-894-4899-7). Apart from this COST-76 final report, a special report summarizing all operational aspects of the WPR technique had been compiled out of the final report in an WMO instruments and observing methods report (IOM-79). The following paragraphs will give a brief summary on this special report for further discussion within the ET-RSUAT&T.

The IOM report No.79 is a collection of output from the three working groups of COST-76, which were associated with WPR operations. The first section contains a report on the status of frequency allocations for profilers. When planning to operate a wind profiler it is essential to understand national limitations on the frequencies to be used. As wind profilers have been given secondary status, operations have to co-exist with other higher priority radiofrequency services. The limitations on frequency use may also vary with location within a given country, as well as from country to country in Europe similar as in other parts of the world. It will always be necessary to negotiate the frequency use through the national radio-communication authorities.

The second section indicates the data availability, i.e. system reliability as well as height coverage. It furthermore describes the accuracy of wind measurements that can be expected from the present generation of wind profilers, based on performance surveys conducted by Lindenberg observatory, Germany. It also identifies the reasons for large wind measurement anomalies that have been noted on some occasions.

Section 3 describes the techniques used in real-time quality evaluation, based on procedures developed by the CWINDE network hub in the UK.

Section 4 is a consideration of wind profiler maintenance policies, based on the development work at Lindenberg Observatory.

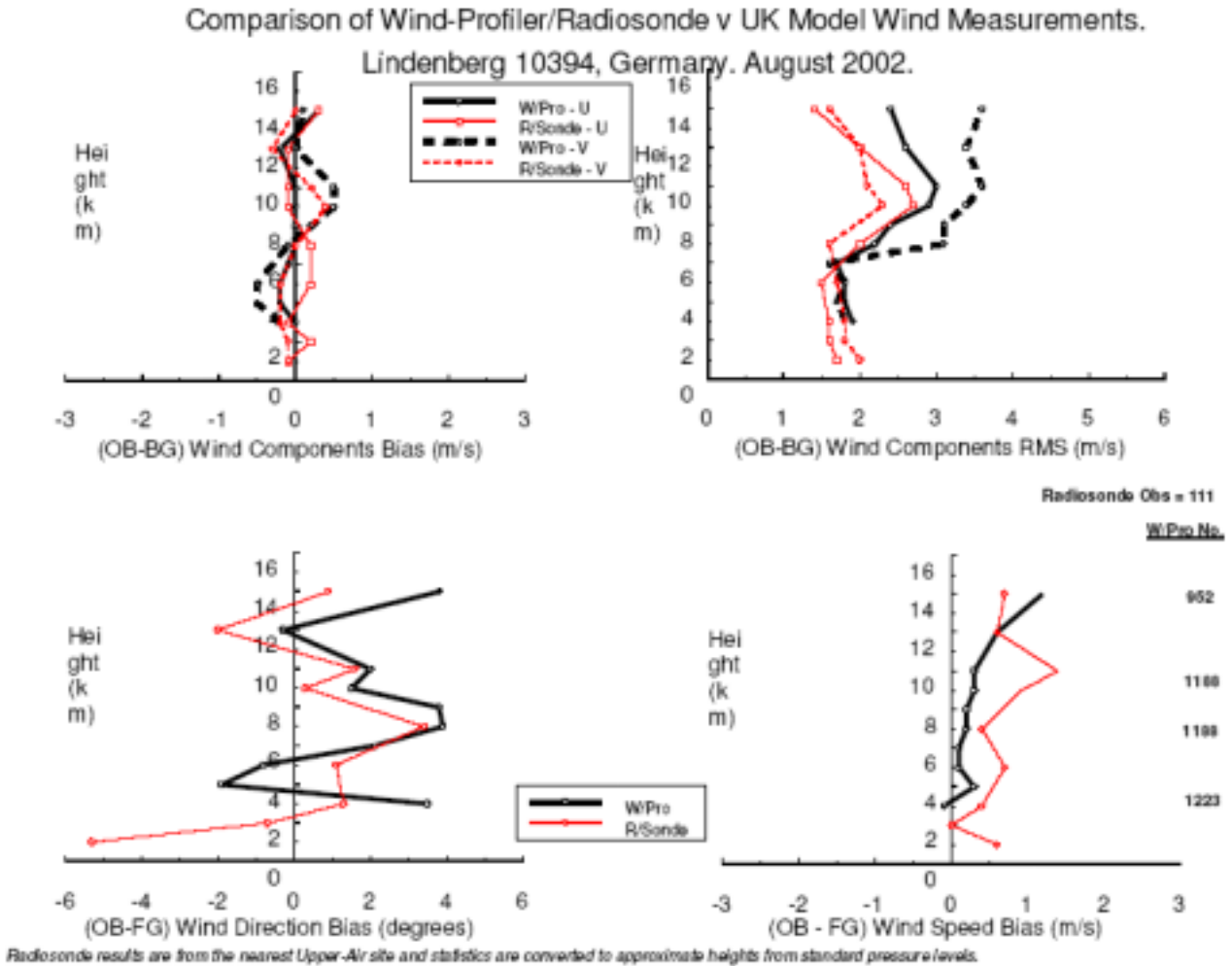
Section 5 provides information on the operational characteristics of present wind profilers based on experience from a pilot network of four wind profilers in the UK.

Section 6 is a summary of some of the problems that have been identified in selecting sites for the present profilers in Europe and section 7 is a summary of the results of a major block of work performed by the two main working groups to generate suitable codes (BUFR coding tables) for circulating wind profiler data on the meteorological telecommunications network. This is followed by a report from the UK on the methods used to circulate wind profiler data in the CWINDE network in section 8.

The final section 9 then provides information on the economic factors influencing the operational costs of the use of wind profilers. This information is based on several thorough surveys of national experience covering all the participants within COST 76.

In summary, the IOM-79 report thoroughly describes the status of WPR sounding and all respective topics at the end of 2001. Between 2002 and 2004 a first phase of the proposed

WINPROF programme under the roof of EUMETNET was realized successfully. As an outcome, the former COST-76 network has now reached operationality for several NMHSs, whose NWP departments use the quality-proven data of the network for their data assimilation successfully, i.e. with significant positive impact on the quality of forecast products. The attached figure may outline this context by demonstration of the comparison between NWP analysis data (model background) and WPR measurements from the 482 MHz system at Lindenberg Observatory, Germany. The figure makes evident, that the WPR data, which are available every 30min, have similar or better data quality (see e.g. the BIAS in wind speed) than the aerological standard, the radiosonde wind measurements.



Further improvements in quality and data availability of the different WPR and institutions of the network is now to be realized by a continuation programme of this EUMETNET activity (WINPROF-II), which will now make the European WPR network part of the European EUCOS programme, i.e. a permanent observation programme.