WORLD METEOROLOGICAL ORGANIZATION

COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION
OPAG-UPPER-AIR

JOINT MEETING

CIMO EXPERT TEAM ON UPPER-AIR SYSTEMS INTERCOMPARISONS
First Session

AND
INTERNATIONAL ORGANIZING COMMITTEE (IOC) ON UPPER-AIR SYSTEMS INTERCOMPARISONS
First Session

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PROGRESS OF TESTING "UNIVERSAL" UPPER-AIR SYSTEMS

Operational Demonstration of the New "Universal/Flexible" Upper Air System at Dar Es Salaam

(Submitted by Richard Thigpen, GCOS)

Summary and purpose of document

This document provides background information on the operational demonstration of the "Universal / Flexible" Upper Air Systems in Dar Es Salaam, Tanzania.

Action proposed

The meeting is invited to note and comment on the information contained in the report and take actions on the issues raised in the report, as appropriate.

Operational Demonstration of the New "Universal / Flexible"

Upper Air System at Dar Es Salaam

1. Upper air observing systems based on GPS technology is in wide use around the world. The cost of the radiosondes needed by these systems however is a major financial burden and many nations simply cannot afford to operate such systems. In particular the GCOS Upper Air Network (GUAN) has several stations in critical locations that have ceased operation because they cannot afford the radiosondes. In a fairly recent technical paper presented to CIMO, it was shown that in many parts of the world, because of relatively low winds, radio direction finding (RDF) radiosondes can be used without degradation in accuracy of the wind direction and speed components of the observations. The same sensors for temperature and humidity are generally used in both the RDF and GPS versions of the radiosondes so the temperature and humidity components are measured consistently. RDF radiosondes generally cost 50% less so a major reduction in operating costs can be realized. The current price of GPS radiosondes is roughly $200 while the price of the RDF version of the same radiosonde may be as low as $100.

2. Further, recent technological developments have lead to the availability of upper air observing systems that can work with different manufacturers radiosondes providing a price competition. Also these newer radiotheodolite systems, operating in the 1680 MHz band, have become substantially more robust and more automatic permitting one-person operation. These systems have been in operation in the Caribbean for several years and appear to work quite well. In fact some current GCOS stations are using these systems. They have not yet been widely deployed as a lower operating cost alternative to the expensive GPS systems.

3. The newly activated GUAN station at Dar es Salaam is receiving such a system. There is interest in conducting an operational demonstration of this system using a variety of different radiosondes to validate this approach to reducing operating costs. The operational demonstration of this system was discussed and endorsed at the CIMO Expert Team on Up-Grading the Radiosonde Network Meeting held in Geneva 3-7 November 2003.

4. The UK Met Office has expressed a willingness to lead the development and conduct of this demonstration through the Chair of the CIMO Expert Team on Upper-Air Systems Intercomparisons, John Nash. Dr. Nash would be assisted by other members of the UK Met Office as well as other invited experts. The demonstration will be conducted in close coordination with World Weather Watch and the GCOS Secretariat. Dr. Nash will, in coordination with the WWW, GCOS, and other experts, design demonstration, prepare the operational procedures, provide any data gathering or recording equipment, furnish the necessary radiosondes and balloons, and prepare a final report of the results. Funds will be transferred from the GCOS Secretariat and will be matched by extensive technical and managerial contributions of the UK Met Office.

5. This demonstration has been discussed with the Tanzania Meteorological Agency, including the Director and they also endorse this demonstration. They will conduct the actual test flights.

6. Our interest of course is to demonstrate that there are lower cost alternatives for some of the developing countries so that we will obtain better performance of the GUAN. This would encourage wider use of such systems and benefit many developing countries