

**CBS Lead Centres for GCOS
Coordination Meeting**

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Availability of CLIMAT and CLIMAT TEMP reports from RBCN stations at MTN centres

(Submitted by the WMO Secretariat)

Summary and Purpose of Document

This document contains the analysis of the results of monitoring exercises coordinated by the WMO Secretariat, concerning the availability of CLIMAT and CLIMAT TEMP reports at MTN centres. It also contains information on the Integrated WWW Monitoring (IWM) and the WWW Operational Information Service (OIS).

Action Proposed

The meeting is invited to take note of these monitoring results when formulating appropriate recommendations concerning the availability of CLIMAT and CLIMAT TEMP reports from RBCN stations at MTN centres. The meeting may particularly wish to recommend that the GCOS centres co-ordinate with these GTS centres action based on the use of the WWW operational information with a view to ensuring the reception of the required CLIMAT and CLIMAT TEMP bulletins exchanged on the GTS at their centres, and the meeting may also wish to consider the role that the CBS lead centres for GCOS should take in these activities.

- Appendices:**
- A. Charts showing the availability of CLIMAT and CLIMAT TEMP reports from RBCN stations at MTN centres (global and regional coverage)
 - B. Charts showing the availability of CLIMAT and CLIMAT TEMP reports from RBCN stations at MTN centres (global and regional coverage)

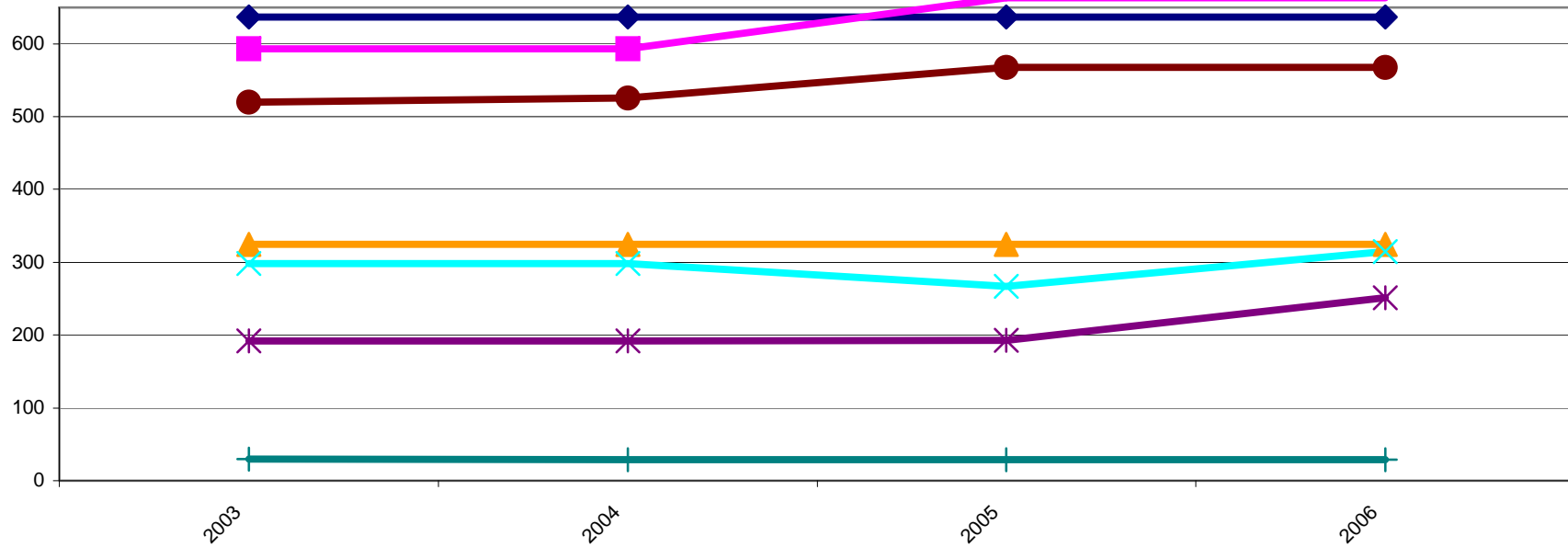
DISCUSSION

Availability of CLIMAT and CLIMAT TEMP reports from RBCN stations at MTN centres

Annual Global Monitoring (AGM)

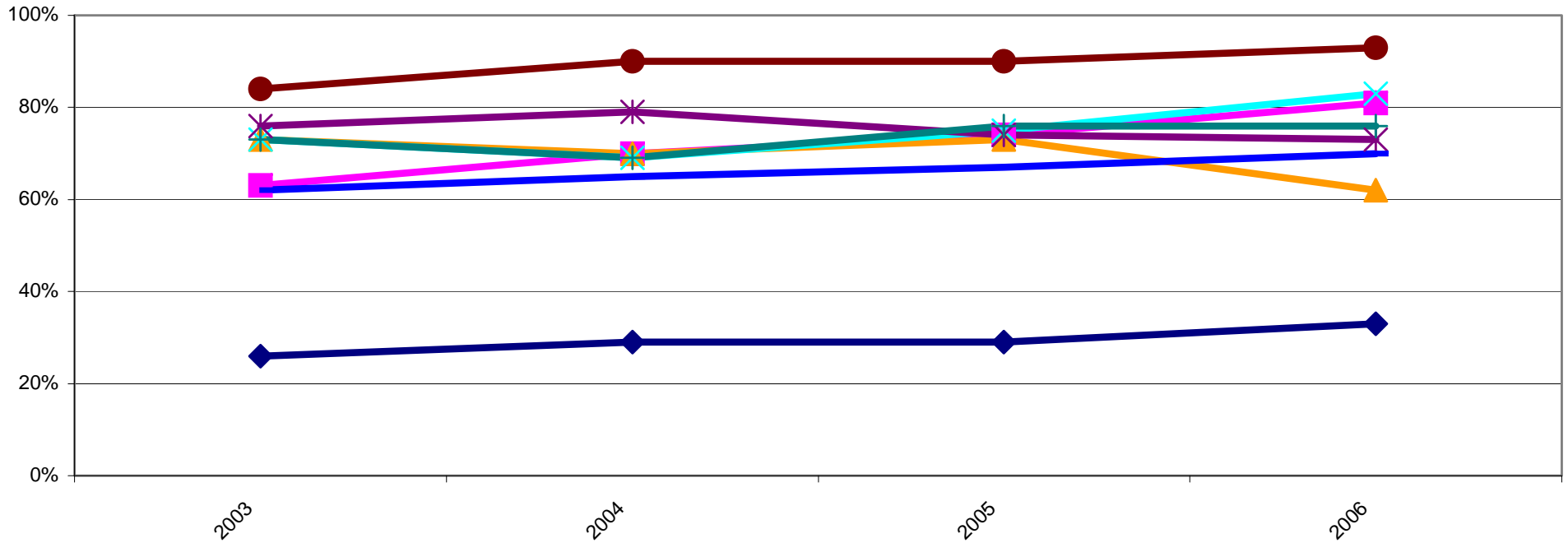
1. The Annual Global Monitoring (AGM) of the WWW is a WWW quantitative monitoring exercise carried out by about 90 centres, including 15 centres of the Main Telecommunication Network (MTN) of [the Global Telecommunication system \(GTS\)](#), once a year from 1 to 15 October. General information on the WWW quantitative monitoring exercises coordinated by the Secretariat, including the AGM, is available on the WMO server from <http://www.wmo.int/pages/prog/www/ois/monitor/monitor-home.htm>.
2. Tables A and C show the evolution of the number of surface and upper-air stations included in the RBCNs for the period 2003-2006. A summary of the analysis made by the Secretariat on the monitoring results concerning CLIMAT and CLIMAT TEMP reports for the October 2003 to 2006 of the AGM is given in Tables B and D. The numbers of reports received by MTN centres during the monitoring exercise were compared to the numbers of reports expected from the RBCNs. provide detailed results by Region. Appendix A to this document shows the locations from which reports were received or not in October 2006. Further detailed information on the analysis of the AGM exercises is available in the WMO server from ftp://www.wmo.int/GTS_monitoring/AGM/QM_AGM1.htm.
3. MTN centres received in total 70 per cent of the CLIMAT reports expected from the RBCN stations in October 2006. This percentage of CLIMAT reports increased by about 2 to 3 per cent each year from 2003 to 2006. The number of surface RBCN stations increased during that period from 2595 to 2788 (+7.4 per cent).
4. MTN centres received in total 80 per cent of the CLIMAT TEMP reports expected from the RBCN stations in October 2006. This percentage increased from 67 per cent in 2003 to 80 per cent in 2006. The number of upper-air RBCN stations increased during that period from 512 to 530 (+3.5 per cent).
5. The Analysis of the AGM results shows that the availability of CLIMAT and CLIMAT TEMP reports at MTN centres in October 2006 is not satisfactory in certain areas. The percentage of CLIMAT reports received from Region I is low (33%); There are sub-regional areas from which scarce CLIMAT and/or CLIMAT TEMP reports were received, particularly in the south-western part of Region II, in the north-western part of Region III, in the southern part of Region IV and in Region V between 0° and 10° S.
6. It should also be noted that the density of the upper-air RBCN stations in Region I is low compared to other Regions

Table A - Number of surface stations in the RBCNs in 2003, 2004, 2005 and 2006



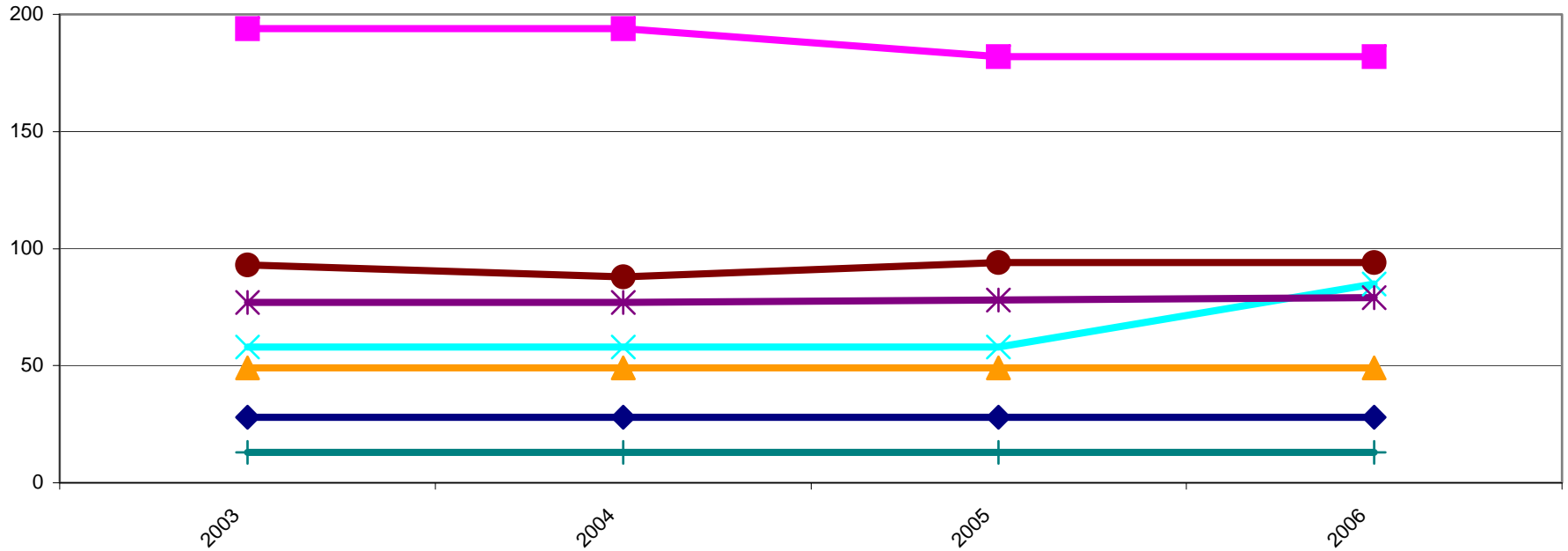
	Oct-03	Oct-04	Oct-05	Oct-06
Region I	637	637	637	637
Region II	593	593	663	663
Region III	325	325	325	325
Region IV	298	298	267	315
Region V	192	192	193	251
Region VI	520	526	568	568
Antarctic	30	29	29	29
Total	2595	2600	2682	2788

Table B - Percentage of CLIMAT reports received during the 2003, 2004, 2005 and 2006 October AGM in comparison with the numbers of reports required from the RBCN stations



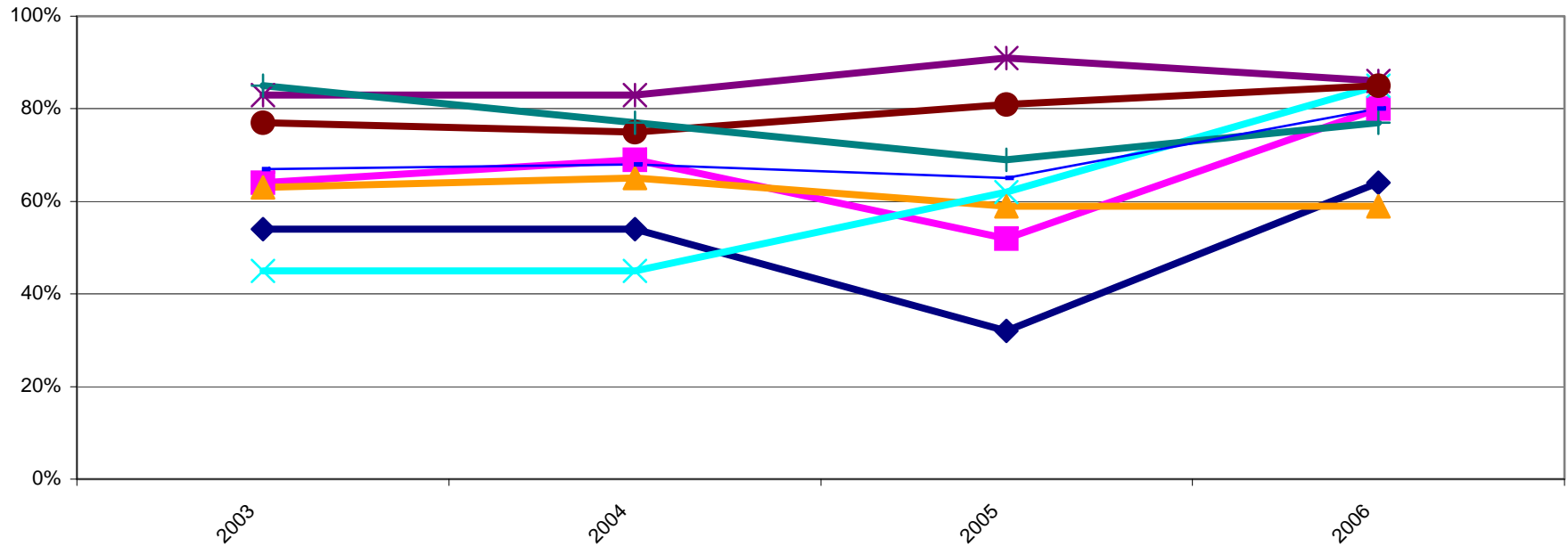
	Oct-03	Oct-04	Oct-05	Oct-06
◆ Region I	26%	29%	29%	33%
■ Region II	63%	70%	74%	81%
▲ Region III	73%	70%	73%	62%
✕ Region IV	73%	69%	75%	83%
✱ Region V	76%	79%	74%	73%
● Region VI	84%	90%	90%	93%
+ Antarctic	73%	69%	76%	76%
■ Total	62%	65%	67%	70%

Table C - Number of upper-air stations in the RBCNs in 2003, 2004, 2005 and 2006



	Oct-03	Oct-04	Oct-05	Oct-06
Region I	28	28	28	28
Region II	194	194	182	182
Region III	49	49	49	49
Region IV	58	58	58	85
Region V	77	77	78	79
Region VI	93	88	94	94
Antarctic	13	13	13	13
Total	512	507	502	530

Table D - Percentage of CLIMAT TEMP reports received during the 2003, 2004, 2005 and 2006 October AGM in comparison with the numbers of reports required from the RBCN stations



	Oct-03	Oct-04	Oct-05	Oct-06
Region I	54%	54%	32%	64%
Region II	64%	69%	52%	80%
Region III	63%	65%	59%	59%
Region IV	45%	45%	62%	85%
Region V	83%	83%	91%	86%
Region VI	77%	75%	81%	85%
Antarctic	85%	77%	69%	77%
Total	67%	68%	65%	80%

Special MTN Monitoring (SMM)

7. The Special MTN Monitoring (SMM) is a WWW quantitative monitoring exercise carried out by several MTN centres four times a year. General Information on the SMM is available on the WMO server from <http://www.wmo.int/pages/prog/www/ois/monitor/monitor-home.htm>. The analysis of the July 2007 SMM monitoring results is available on the WMO server from ftp://www.wmo.int/GTS_monitoring/SMM/From_WMO/sm07701.015/SMM077.htm. The analysis shows lower figures for the availability of the CLIMAT and CLIMAT TEMP reports at MTN centres for the SMM exercises than for the AGM exercises. This is mainly due to the fact that the AGM statistics include the availability of the reports at 15 MTN centres instead of three for the SMM, and that the pre-analysis of the SMM raw data made by Cairo systematically rejects the reports for which the format of presentation is not conform to the WMO standards. The monitoring of the exchange of CLIMAT and CLIMAT TEMP bulletins on the GTS shows major deficiencies in the application of WMO standards for the presentation of CLIMAT and CLIMAT TEMP bulletins. In 2004, the WMO Secretariat had investigated deficiencies in the application of WMO standards in the presentation of CLIMAT and CLIMAT TEMP bulletins. A summary of the findings is available in Appendix B; more information is available from http://www.wmo.int/pages/prog/www/WDM/Documentation/Deficiencies-CLIMAT_CL-TEMP.pdf. The WMO Secretariat informed the WMO Member countries of the deficiencies found for each country and invited them to take action in order to eliminate the deficiencies.

Integrated WWW monitoring (IWM)

8. The implementation of the Integrated WWW Monitoring project should lead to the integration of the Annual Global Monitoring (AGM) and the Special MTN Monitoring (SMM) into one monitoring scheme. The main features of the IWM are given in paragraphs 8.1 to 8.5. More information is available from the guide on the implementation of the IWM (see http://www.wmo.int/pages/prog/www/ois/monitor/monitor-home/iwm/guide_implementation_IWM.htm).

8.1 As for the Annual Global Monitoring (AGM), the centres should at least monitor the part of the global data set for which they are responsible to collect and forward on the GTS:

- National Meteorological Centres (NMCs) should at least monitor data from their own territory;
- Regional Telecommunication Hubs (RTHs) should at least monitor data from their associated NMCs, and possibly from their own Region;
- World Meteorological Centres (WMCs) and RTHs located on the Main Telecommunication Network (MTN) should monitor the complete global data set.

8.2 As for the AGM, the monitored data set should include the observations from the stations included from the Regional Basic Synoptic Networks (RBSNs) for the main synoptic hours (00, 06, 12 and 18 UTC) and from the stations included in the Regional Basic Climatological Networks (RBCNs). The types of data to be monitored are further detailed in Table A of the Annex to the guide.

8.3 The monitored data set should include the data presented in Traditional Alphanumeric Codes (TAC) and in Table-Driven Code Forms (BUFR, CREX).

8.4 The monitoring periods are: 1-15 January, April, July and October.

8.5 The flow of the monitoring reports is as follows (see also Figure 2 of the guide):

- NMCs prepare quarterly summary reports and send them to their associated RTHs;
- RTHs compile the summary reports received from the NMCs in their zones of responsibility together with their own monitoring summaries and send their quarterly RTH summary reports to the associated RTH on the MTN and the WMO Secretariat;

- RTHs on the MTN participating in the Special MTN Monitoring (SMM) continue sending their raw data to the Secretariat and the other RTHs on the MTN send quarterly RTH/MTN summary reports to the Secretariat

9. CBS-Ext.(06) agreed to move from the test phase to a pre-operational phase of the IWM as from October 2007. CBS-Ext.(06) stressed the key role of the RTHs in the IWM since they are responsible for collecting monitoring reports from their associated RTHs and to send the consolidated IWM monitoring reports to their associated MTN centres and to the Secretariat. As requested by CBS-Ext.(06), the WMO Members operating an RTH have been invited to participate in the pre-operational phase of the IWM as from October 2007.

Use of the WWW operational information with a view to improving the exchange of CLIMAT and CLIMAT TEMP reports

10. The CLIMAT and CLIMAT TEMP reports exchanged on the GTS are presented in accordance with the code forms FM 72-XII CLIMAT and FM 75-XII CLIMAT TEMP (see Manual on Codes: <http://www.wmo.int/pages/prog/www/WMOCodes/ManualCodesGuides.html>). WMO planned to migrate from Traditional Alphanumeric Codes (TAC), such as FM 72-XII CLIMAT and FM 75-XII CLIMAT TEMP, to Table Driven Code Forms (TDCF) (e.g. BUFR, CREX) (see <http://www.wmo.int/pages/prog/www/WMOCodes/MigrationInfoDocum.html>). As regards CLIMAT and CLIMAT reports, the operational exchange in TDCF started in November 2005 and the migration should be completed by November 2010.

11. The CLIMAT and CLIMAT TEMP reports issued from the RBCN stations are parts of the global set of observational data exchanged on the Global Telecommunication System (GTS) of the WWW. The CLIMAT and CLIMAT TEMP reports are compiled within bulletins, which are exchanged on the GTS. The GTS consists of an integrated network of point-to-point circuits, and multi-point circuits, which interconnect meteorological telecommunication (GTS) centres (see <http://www.wmo.int/pages/prog/www/TEM/gts.html>). The bulletins received by each node of the network (or GTS centre) are switched to the adjacent GTS centres or to point-to-multipoint systems (e.g. satellite distribution system) in accordance with predefined tables (also called routeing catalogues). The WWW centres make arrangements to relay CLIMAT and CLIMAT TEMP bulletins on the GTS with a view to satisfying the specific requirements of each of the centres. These arrangements include the maintenance or updating of the routeing catalogues of the GTS centres for the relay of the required bulletins from the originating centre to the recipient centres. WWW operational information are used to assist the centres in developing the arrangements and monitoring their implementation, such as:

- The list of observing stations (volume A of WMO Publication No. 9), including the stations making CLIMAT and CLIMAT TEMP reports, (see <http://www.wmo.int/pages/prog/www/ois/volume-a/vola-home.htm>)
- The list of RBCN stations (see <http://www.wmo.int/pages/prog/www/ois/rbsn-rbcn/rbsn-rbcn-home.htm>),
- The catalogue of meteorological bulletins (Volume C1 of WMO Publication No. 9), including information on the CLIMAT and CLIMAT TEMP bulletins exchanged on the GTS, in particular the list of stations, the reports of which are compiled within the bulletins (see http://www.wmo.int/pages/prog/www/ois/Operational_Information/VolC1.html),
- The routeing catalogues, providing information on the routeing of bulletins by GTS centres (see http://www.wmo.int/pages/prog/www/ois/Operational_Information/RtnqCat.html)
- The monitoring reports, showing the availability of CLIMAT and CLIMAT TEMP bulletins and reports at WWW centres. With a view to sharing resources for WWW monitoring activities between WWW centres, several complementary monitoring exercises are carried out each year: the Annual Global Monitoring (AGM) of the operation of the WWW, the Special MTN

Monitoring (SMM) and the Specific Antarctic Monitoring (SAM) (see <http://www.wmo.int/pages/prog/www/ois/monitor/monitor-home.htm>). The monitoring exercises provide a significant set of information, which can be used by any centre to compare the availability of reports and bulletins at its centre to that of the GTS centres. The set of information ranges from the raw data (e.g. complete set of CLIMAT and CLIMAT TEMP bulletins/reports as received by several MTN centres) to the summaries of statistics.

- The operational Newsletter of the WWW (see http://www.wmo.int/pages/prog/www/ois/Operational_Information/index.html), including urgent notifications and a summary of the latest operational information on the World Weather Watch, for example changes concerning CLIMAT and CLIMAT TEMP bulletins/reports.

12. More information on the Operational Information Service (OIS) is available from <http://www.wmo.int/pages/prog/www/ois/ois-home.htm>, in particular from the note on the best practices for the management of the operational information (http://www.wmo.int/pages/prog/www/ois/best_practices_OI.doc).

Proposed Recommendation

13. The GCOS centres receive CLIMAT and CLIMAT TEMP bulletins from GTS centre(s). The GCOS centres should co-ordinate with these GTS centres action based on the use of the above WWW operational information with a view to ensuring the reception of the required CLIMAT and CLIMAT TEMP bulletins exchanged on the GTS at their centres. The role of the CBS lead centres for GCOS in these activities should be further considered.

Appendix A

Charts showing the availability of CLIMAT and CLIMAT TEMP reports from RBCN stations at MTN centres (global and regional coverage)

[Appendix A is available in a separate pdf document]

Appendix B

Deficiencies in the application of the WMO standards for the presentation of the CLIMAT and CLIMAT TEMP bulletins

Summary

The amount of the CLIMAT and CLIMAT TEMP bulletins, which do not comply with the WMO standards for presentation of the bulletins, were significant during two Special MTN Monitoring (SMM) exercises in April and October 2004. Table 1 shows the number of the CLIMAT and CLIMAT TEMP reports and bulletins received during these two exercises as well as the number and the percentage of the bulletins in which the deficiencies have been discovered.

Table 1

		April 2004 SMM	October 2004 SMM
CLIMAT bulletins	Number of bulletins received	398	435
	Number of bulletins with deficiencies	80 (20%)	76 (17%)
CLIMAT TEMP bulletins	Number of bulletins received	196	206
	Number of bulletins with deficiencies	57 (29%)	84 (41%)

The most frequent deficiencies found in the CLIMAT and CLIMAT TEMP bulletins were:

- Misspelling or omitting the code name CLIMAT or CLIMAT TEMP in the first line of the text
- Repeating the code name CLIMAT or CLIMAT TEMP in the same bulletin
- Incorrect or omitted group MMJJJ
- Repeating MMJJJ in the same bulletin
- Station index Iliii is not in the beginning of the line or repeated or omitted.

These deficiencies could lead to different counting of the bulletins collected in the different monitoring centres depending on the tolerance of their software to the deficiencies. The centres with the more sophisticated software could count more CLIMAT and CLIMAT TEMP reports because they can find the deficiencies and can make required corrections. The centres with the less sophisticated software could lose some bulletins with deficiencies and count fewer bulletins.

The first four deficiencies in the list above are generated at the collecting centres and not at the observing stations. These deficiencies are generated manually or automatically during the compilation of the reports from several stations into one bulletin. The necessary assistance should be given to these centres to improve the situation.

On the other hand, some deficiencies in CLIMAT and CLIMAT TEMP bulletins were generated by the observing stations. Two of these deficiencies are:

- The data are not presented according to code forms FM 71-XII or FM 75-XII
- The section groups in the CLIMAT reports are incorrect, omitted or incorrectly placed.

These deficiencies are not too much frequent and they could be eliminated if the necessary training is given to the staff of particular stations.

Recommendations

- To inform the climatological centres of the results of the analysis of the presentation of CLIMAT and CLIMAT TEMP bulletins and to invite them to assess the negative impacts of the deficiencies found on their products and services. Special attention should be paid to the possible loss of reports. From this assessment, a list of priority action to further monitor each type of deficiencies should be established.
- To train the operational staff at the compiling centres and at the CLIMAT reporting stations in applying the WMO standards for the presentation of the CLIMAT and CLIMAT TEMP reports and bulletins. For this purpose, the regular evaluation of the collected bulletins should be done. The national focal points on the CLIMAT and CLIMAT TEMP issues should be informed interactively about deficiencies in the bulletins from their countries. It is necessarily to arrange the regional and sub-regional workshops on the issue.
- To re-consider the WMO standards to improve the quality and reliability of the CLIMAT and CLIMAT TEMP bulletins taking into account the advantages in using computers for coding and decoding the meteorological data.
- The climatological centres and the Secretariat should share the responsibilities to further monitor the presentation of CLIMAT and CLIMAT TEMP bulletins, using in particular the SMM data, and to further undertake the follow-up actions to overcome the deficiencies. Automatic detection of the deficiencies in the SMM bulletins should be envisaged.
- Finally, it is necessarily to find financial support from the WMO budget and from the international community to continue and expand the activities in improving the quantity and quality of the CLIMAT and CLIMAT TEMP reports from the observing stations.