WORLD METEOROLOGICAL ORGANIZATION

==========

REGIONAL ASSOCIATION II

WORKING GROUP ON PLANNING AND IMPLEMENTATION OF THE WWW IN REGION II

THIRD SESSION

(DOHA, QATAR, 17-21 OCTOBER 1999)

FINAL REPORT

GENERAL SUMMARY OF THE WORK OF THE SESSION

1. OPENING OF THE SESSION (agenda item 1)

1.1 At the kind invitation of the Government of Qatar, the third session of the Working Group on Planning and Implementation of the WWW in Region II was held at the Qatar Aeronautical College, Doha from 17 to 21 October 1999 (The list of participants is given in Annex I). Dr Ali Hamid Al-Mulla, Deputy Director of Department of Civil Aviation and Meteorology and Permanent Representative of Qatar with WMO, welcomed the participants on behalf of the Government of Qatar. He encouraged all participants to submit their views and proposals on all issues that were going to be presented at the meeting. Dr Ali Hamid Al-Mulla briefed the meeting on the National Meteorological Service, in particular regarding successful solving of Y2K problem in Qatar. He wished participants a nice stay in Qatar.

1.2 Mr E.H.Al-Majed, Director of WMO Regional Office for Asia and the South-West Pacific welcomed the participants on behalf of the Secretary General of WMO. He stated that the World Weather Watch is one of the most important and basic programmes of WMO. Implementation of its three basic components, the Global Observing System, the Global Data Processing System and the Global Telecommunication System, in accordance with the WMO Long-Term Plans, is of great significance in RA-II. He further mentioned that Region II was largest among the WMO Regions and had its own problems due to great diversity within the Region.

1.3 Dr E. Sarukhanian, Chief, Observing System Division of the WWW Department pointed out that the Working Group made a good progress since November 1995, when it was re-established by the eleventh session of Regional Association. Several surveys were carried out among the Members of RA II, regarding various WWW components. Report of chairman and rapporteurs had been prepared and submitted to this session as working documents. Dr Sarukhanian urged members of the Working Group to prepare recommendations for action to ensure that the implementation of the WWW in Region II would proceed at a satisfactory level. In this connection, he mentioned that proposals developed by the Implementation Co-ordination Meeting on the GTS, which was held previous week in Doha, should also be reviewed and approved by this session. In concluding his remarks, Dr Sarukhanian expressed his appreciation to the Government of Qatar for hosting the session and thanked Dr Al-Mulla and his staff for their hard work in making the necessary preparations. He also expressed his confidence that the results of the session would be of significant benefit to the implementation of the WWW in Region II.

1.4 In his opening remarks, Dr K. Prasad, chairman of the working group welcomed the participants and drew attention of the meeting to the wide terms of reference given to the working group, involving a substantial amount of work. He expressed satisfaction that good progress had been made by members of the working group in their assigned tasks and expressed confidence that the efforts would continue at the same level to accomplish the remaining tasks. He pointed out that many new developments had taken place since the last working group meeting in 1995 in New Delhi. All these developments have thrown up new opportunities and problems for the meteorological community. He called upon the Working Group to take note of these developments and give a proper direction to their activities accordingly. The chairman declared the session open.

2. ORGANIZATION OF THE SESSION (agenda item 2)

2.1 <u>Adoption of the Agenda (agenda item 2.1)</u>

The session adopted the agenda as shown in Annex II.

2.2 Other organisational questions (agenda item 2.2)

The session agreed on its working hours.

3 REPORT OF THE CHAIRMAN OF THE WORKING GROUP (agenda item 3)

3.1 Dr K. Prasad (India), chairman of the working group gave an in-depth review of the developments in operational World Weather Watch during the intersessional period, organisation of the work programme and of activities to date. He recalled that the eleventh session of RA II (Ulaanbaatar, Mongolia, 24 September-3 October 1996) re-established the working group with revised Terms of Reference. He noted that the current membership of the group consisted of 17 experts from 12 Members including the chairman, co-ordinator of the Sub-group on Regional Aspects of the GTS, and four Rapporteurs on Regional Aspects of the GOS, GDPS, Data Management and Public Weather Services. He also pointed out that the work plan of the group was formulated on the basis of the WMO Long-term Plans and decisions made by the eleventh session of RA II, and the eleventh session of CBS and last session of working group. It included among others :

- Data reporting by RBSN and a review of RBSN list
- Availability of CLIMAT and CLIMAT TEMP reports
- Maintenance, updating and exchange of comprehensive catalogues of meteorological bulletins
- Introduction of new telecommunication technologies and services in the RMTN plan and upgrading of GTS in Region II
- Upgrading capabilities of NMCs in RA II in the interpretation of NWP products
- Harmonisation of severe weather warnings issued by adjacent NMSs
- Environmental Emergency Response Activity
- Use of BUFR and CREX for data representation
- Use of the Internet
- Implementation strategy for the Public Weather Services Programme

3.2 The chairman noted that following circulation of the work plan, the co-ordinator of the sub-group on Telecommunications and Rapporteurs on Regional Aspects of the WWW components have done substantial work within their terms of reference. They made proposals regarding revision of the Regional Basic Synoptic Network, extension of the distribution of CLIMAT messages, improvement of telecommunication and data processing systems in the Region. All these proposals were discussed under the relevant agenda items.

3.3 The chairman concluded that there has been significant progress towards the strengthening of National Meteorological and Hydrological Services in the Region. However, inadequacies in the network of observations and telecommunications as well as in data-processing facilities still exist, particularly in developing countries and Newly Independent States. Therefore while the working group can derive satisfaction from the fact that there has been some significant accomplishment since it was re-established, much remains to be done. In this connection, the chairman gave his proposals for the future work programme, which were considered by the session under agenda item 10.

4 CONSIDERATION OF THE DECISIONS OF THE ELEVENTH SESSION OF RA II, CBS EXTRAORDINARY SESSION (1998), THIRTEENTH CONGRESS AND EC-LI INCLUDING REQUIREMENTS FOR WWW SUPPORT TO OTHER PROGRAMMES (agenda item 4)

4.1 The Session reviewed the main decisions of the eleventh session of RA II, CBS Extraordinary session (1998), Thirteenth Congress and Executive Council. Attention was drawn to the decisions and recommendations relating to the implementation of the WWW in the Region. The working group noted that the Regional Association, CBS and Congress had reaffirmed the importance of the WWW as the basic programme of the Organization and agreed that its further development should continue to have the highest priority. Detailed discussion on the implementation by the working group of the decisions of the WMO constituent bodies relating to observing networks, data-processing and telecommunication systems as well as WWW data management and Public Weather Services took place under appropriate agenda items. The session considered among others two particular issues, which require specific attention of the working group – new structure of the CBS and the inter-relation between CBS and the Global Climate Observing System Programme (GCOS).

Working Structure of CBS

4.2 The working group was informed that following the request of the forty-eighth session of the Executive Council (June 1996) to study the most effective way of organising the working structure of CBS, the CBS, at its extraordinary session (October 1998), adopted Resolutions 2 and 4 (CBS-Ext. (98)) regarding the new working structure of the Commission. In the new structure, the Commission has grouped the programmes for which it has the technical responsibility in four « Programme Areas »: Integrated Observing Systems (IOS), Information Systems and Services (ISS), Data-Processing and Forecasting Systems (DPFS) and Public Weather Services (PWS). Open Programme Area Groups (OPAGs) have been established to look after the activities under four areas. At present, the four OPAGs have registered more than 300 members. Members of OPAGs were expected to work and receive information by correspondence. The main tool for the information flow is the CBS Newsletter issued quarterly to more than 400 individuals via e-mail and to some 280 addressees via regular mail. The Newsletter reports regularly on the work of CBS, the Advisory Working Group and the teams (see below), including organisational matters, meetings/conferences and publications. The working documents and the final reports of the meetings are put on the WMO Web server. Each member is invited to provide views, comments, concerns or criticism to the contact person listed in various sections of the Newsletter.

4.3 The group was also informed that the task defined by CBS were carried out through two types of teams: Expert Teams (ETs) that are mainly based on expertise for developing proposals and solutions to scientific/technical problems, and Implementation/Coordination Teams (ICTs) that are mainly based on regional representation to focus on co-ordinating operational implementation aspects. While the session was pleased to note that regional representation in ICTs was successfully made through the nomination of coordinators and Rapporteurs as members of ICTs of the appropriate OPAGs, it expressed some concern that the representation of developing countries and countries with economy in transition was not well balanced. The group recommended that CBS strengthen the link with regional associations with respect to achieving a coordinated implementation of the WWW through a better balanced participation of experts from developed and developing countries from all Regions.

4.4 The group recognized many advantages in the very active information strategy of CBS, as it provides more information than ever before through the Internet to all interested experts. Many issues were now better documented and brought directly to the attention of members at an early stage in the development processes. The group encouraged all experts concerned in the Region to make use of this opportunity by submitting input or comments to the relevant contact points given in the CBS Newsletters.

4.5 The group voiced some concern that the current set up and composition of the ETs may have a tendency to underestimate the issues related to the feasibility of implementation of the concepts they develop in the Regions, in particular in developing countries. It was also indicated that there were overlaps in the tasks given to some ETs and ICTs, which may cause confusion and overburden the experts involved. The group recalled that the new working structure was actually a trial, and it expressed the view that more time was still needed to draw well-founded conclusions on the effectiveness of the new CBS working structure. The group finally felt that much could be gained in terms of ownership and acceptance of the CBS working structure if the teams and their compositions were in the future decided at sessions of CBS.

Inter-relation between CBS and GCOS

4.6 The working group recalled that CBS through its Working Group on Observations provided a substantial contribution to the design and selection of upper-air and surface stations to the GCOS Upper-Air Network (GUAN) and the GCOS Surface Network (GSN). It noted that both networks have been established and presidents of regional associations had approved the lists of GSN and GUAN stations. It also noted that CBS-Ext. (98) had adopted set of recommended best practices for GSN and GUAN stations developed by its former Working Groups on Observations in form of amendments to the Manual of the GOS.

4.7 The session was informed that the Secretariat had distributed recently among Members concerned a circular letter by which the Secretary General invited Members to take specific immediate actions derived from best practices. The Members were requested, in particular to provide CLIMAT messages in a regular and timely manner from GSN stations, to send historical data and meta-data from GSN stations in appropriate formats to World Centre A for Meteorology, and to develop national plans for archiving daily data from GSN stations, and as a result to send the daily data to World Data Centre A for Meteorology. The working group recommended that all RA II Members concerned be urged to consider this matter of high importance and to follow best practices approved by EC-LI. The working group requested the Rapporteur on Regional Aspects of GOS to keep this matter under permanent review, in particular, to monitor the availability of CLIMAT and CLIMAT TEMP reports from GSN and GUAN stations in Region II according to the lists given in Annex III on the basis of results of Specific MTN Monitoring. The Rapporteur should then approach the Members of RA II which have not produced the required number of CLIMAT and CLIMAT TEMP reports with a request to take remedial action. In doing so, the Rapporteur should also use the reports on the availability and quality of upper-air data from GUAN stations provided by ECMWF on six-monthly basis and the six-monthly reports on the availability and quality of data from GSN stations which will be produced and distributed from 1 January 2000 by GCOS monitoring centres in Offenbach (Germany) and Tokyo (Japan). The session confirmed that such activities will follow the recommendation of CBS-Ext. (98) that monitoring of the operation of GUAN and GSN station in each region should be carried out by Commission in close collaboration with the regional working groups.

4.8 The working group recommended that Regional Association should consider advantages and disadvantages of the involvement of other appropriate regional centres in the process of monitoring of the availability of CLIMAT and CLIMAT TEMP reports from GSN and GUAN stations in the region.

5. STATUS OF WWW IMPLEMENTATION AND OPERATION (agenda item 5)

Global Observing System

5.1 The Working Group considered the reports on this item submitted by the Rapporteur on Regional Aspects of the GOS and by the Secretariat. It reiterated that the establishment and maintenance of the RBSN continued to be one of the most important commitments of Members, securing real-time world meteorological data exchange over the GTS and meeting essential WWW requirements. In this connection it noted with satisfaction an evident progress in the implementation of the RBSN in certain parts of the region which contributed to the sustained operations of the GOS. Overall, the implementation of surface and upper-air stations of the RBSN, according to the information provided by Members, constituted 95 % and 88 % respectively.

5.2 The Working Group noted with concern that certain areas of the region have serious problems in providing expected SYNOP and TEMP reports. In particular, it noted that the number of so-called "silent" stations has not diminished in case of RBSN surface stations (more than 10 % of the total number of surface stations) and became even worse with the upper-air network, reaching 31 % of the total number of upper-air stations. It further noted the progressive increase in number of stations providing less than 50 % TEMP reports (8.5 % in 1992, 11 % in 1996 and 22 % in 1998). The Working Group specifically noted the continued deterioration in performance of the upper-air network of the Russian Federation, particularly in remote locations which already has led to the loss of essential upper-air observations over Siberia and Far East. In this connection, the Working Group felt that a detailed identification of the most critical areas and stations in Russia is urgently needed in order to develop proposals for VCP assistance. It recommended that Russian Federation in collaboration with the Secretariat submit an appropriate document to the Informal Planning Meeting of VCP donors in January 2000.

5.3 In view of the alarming situation that has taken place in the implementation of the RBSN in certain parts of the region, the Working Group stressed that every effort should be made to follow-up recommendations of Thirteenth Congress regarding improvement of the current network performance and perspectives of a fundamental redesign of the GOS. It requested the Secretariat to take an appropriate action that Members concerned will be approached with a request to increase the number of upper-air observations twice per day at operational stations and rehabilitate their “silent” stations. The meeting felt that based on the analysis of proposals solicited from Members concerned, priority action items should be elaborated to remedy deficiencies in RBSN on the basis of coordinated approach, new joint funding mechanisms and contributions of potential donors. The Working Group recommended that this priority list should be reviewed and approved by the twelfth session of RA II.

5.4 The session was informed on the progress in replacement of the OMEGA system in the region. It noted that the OMEGA-based equipment was replaced by alternative systems already at 27 upper-air stations and there are still 6 stations where replacement should be made. It also expressed concern with respect to the reliability of the radiosondes based on Global Positioning System (GPS) technology and requested the Secretariat to provide Members with comprehensive information on the results of the GPS-based radiosondes performance survey being conducted by CBS in collaboration with CIMO. The session felt that recommendation developed by CIMO Working Group on Ground-based upper-air systems should be widely distributed among Members who operate GPS-sondes.

5.5 The Working Group considered the performance of other networks, including sea stations. It noted that along with growing number of ships recruited by Members of RA II, there was noticeable drop of ship reports received at MTN centres in the region to a daily average of 195 reports in 1998 compared to 532 in 1995. However, there has been a continuing increase in the deployment of other types of sea stations and, in particular, drifting and moored buoys with71 and 21 buoys respectively. It also noted that reports from almost all these active automated sea stations are exchanged over the GTS.

5.6 The meeting noted the operational availability of sea upper-air observations provided by one Russian and five Japanese ships. It further noted that although the number of ASAP systems operated on ships world-wide has increased up to 15 units, none were so far operational in Region II.

5.7 The meeting noted the progress in the availability of data produced by ASDAR system, currently providing per day of about 2000 reports on the temperature, wind speed, wind direction and turbulence. It noted, however, that there are still relatively few ASDAR data available over the Region II. The meeting agreed that in order to improve the efficiency of ASDAR data in the region, attention should be focussed on data-sparse areas and NMSs in developing countries should have an easy access to these data on a real time basis.

5.8 As regards CLIMAT and CLIMAT TEMP reporting stations, the meeting noted with satisfaction a certain increase in the number of CLIMAT reports originated in the region. However, the situation with CLIMAT TEMP reporting stations had significantly deteriorated. In particular, the monitoring results indicated that in 1998 the number of received CLIMAT TEMP reports was only 128 as compared with 179 reporting stations in 1994. The Working Group felt that this situation is directly interconnected with existing problems in the implementation of RBSN upper-air network in the region. The Working Group recommended that on-going and planned remedial actions towards improvement of RBSN implementation and performance should be fully co-ordinated with maintenance and development of climate data reporting network. It also felt that individual Members should make a greater effort in this respect in the region.

5.9 The meeting noted with great interest information regarding the implementation and future plans for space and ground segments of the space-based subsystem of the GOS. It noted a valuable input to NMS operations of the Region provided by polar-orbiting and geostationery satellites operated by China, EUMETSAT, India, Japan, Russian Federation and USA. It felt that EUMETSAT Polar System (EPS) Programme with three satellites to be launched in 2003, 2007 and 2012 would be an essential contribution to the implementation of current polar-orbiting satellite programmes. The meeting was also pleased to note that a "Statement of Guidance" outlining to what extent satellite capabilities met WMO User requirements in several application areas, including NWP, synoptic meteorology, nowcasting and VSRF, hydrology and agricultural meteorology, had been published as WMO Satellite Activities Technical Document. It stressed that Secretariat should continue to inform WMO Members of scientific and technical developments in observing technology both for the surface and space-based components of the GOS on a regular basis. The meeting expressed its gratitude to the EUMETSAT for maintaining and prolonging the position of Meteosat-5 at 63°E to provide services over the Indian ocean. It urged Members concerned to find way to contribute to EUMETSAT activities in order to assure the continuous operations of Meteosat in this area.

Global Telecommunication System

Status of Implementation of Point-to-point and Point-to-multipoint Circuits

5.10 Information on the status of GTS point-to-point circuits and broadcasts, as well as plans, is given in Annex IV (Figures A and B, and Table A). In Figure A, the GTS point-to-point circuits are shown with the indication of the total speed of transmission. It can be noted that:

(a) All RTHs have at least one connection to another RTH operating at a speed higher than 2400 bits/s (at least 7200 bits/s for most of them);
(b) Twelve NMCs have at least one connection to the GTS operating at a speed higher than 1200 bits/s: Almaty, Bahrain, Dhaka, Doha, Emirates, Hanoi, Hong Kong, Macao, Muscat, Pyong Yang, Seoul and Ulaanbaatar;
(c) Ten NMCs have connections to the GTS, but all the GTS circuits concerned operate at a speed lower than 1200 bits/s: Ashgabad, Bishkek, Colombo, Dushanbe, Kathmandu, Kabul, Karachi, Kuwait, Male and Yangon;
(d) Four NMCs have no connection to the GTS: Baghdad, Phnom Penh, Sanaa and Vientiane.

5.11 Table A of the Annex IV includes also the plans of the GTS centres for the implementation of the GTS circuits. Seven RTHs operate RTT and/or radio facsimile broadcasts (see Figure B of the Annex IV).

5.12 The coverage of the Region II by satellite distribution systems is given in Annex V. Region II is covered by the following satellite systems: ISCS ((primarily ISCS (Pacific)), MDD, MTSAT (planned), TV-Inform-meteo, systems operated by China, India and Thailand, and the UKSF/WWW. The satellite system operated by China was integrated into the RMTN. The UKSF/WWW covers the Region II. The status of the reception of the satellite systems was as follows:

- Bahrain, Islamic Republic of Iran, Kuwait, Oman, Pakistan, Qatar, Republic of Yemen, Turkmenistan, United Arab Emirates and Uzbekistan were equipped to receive MDD;

- Russian Federation and Tajikistan were equipped to receive TV-Inform-meteo;

- Bahrain (CAA*), Bangladesh, China (CAA), Democratic People's Republic of Korea, Hong Kong (China) India, Kuwait, Lao PDR, Maldives, Mongolia (CAA), Nepal, Oman (CAA), Pakistan, Sri Lanka, Thailand, Turkmenistan, United Arab Emirates, Viet Nam(CAA) and Macao were equipped to receive SADIS; China, Hong Kong (China) Japan, Republic of Korea and Viet Nam are equipped to receive ISCS (Pacific).

5.13 The above information shows that there was upgrade of the RMTN during the last two years, which can be summarised as follows:

- For the centres mentioned in the above sub-paragraphs 5.10 (a) and (b), there was an increase of the speed of transmission of the circuits connecting those centres to the GTS (e.g. two MTN centres are connected to the MTN by 64 Kbits/s circuits). All RTHs have at least one connection to the GTS at a speed of 2400 bits/s or higher;

- The centres mentioned in the above sub-paragraphs 5.10 (c) and (d), except for Bishkek, Kabul, Phnom Penh and Yangon, are equipped to receive at least one of the satellite systems;

- The TCP/IP procedures were introduced on eight circuits by eight centres, including seven RTHs.

---

* Civil Aviation Authority

5.14 In accordance with the information provided by 22 GTS centres located in Region II, 15 of these centres use the Internet. The capacity of the centres to use the Internet has increased during the last two years.

Global Data-processing System

5.15 The session reviewed the present status of implementation of the Global Data-processing System in the region on the basis of information provided by Rapporteur on Regional Aspects of GDPS. It noted that survey of GDPS centres conducted by Rapporteur showed that there had been considerable improvements in the infrastructure and models in some centres as given in the Annex VI (Tables 1 and 2). Some centres have introduced the latest super computers and operated global/regional numerical weather analysis/forecast systems. Fifteen centres are operating routine NWP models. Four centres (Tokyo, Novosibirsk, Khabarovsk and Tashkent) are transmitting their NWP products to other NMCs.

5.16 While these developments are encouraging, there are still large gaps in the data-processing capabilities of some developing Members. Some data-processing systems have not been automated and the countries concerned were not able to derive full benefits from the technological advances that have taken place in the recent past. For example, some centres still plot station and product charts manually.

5.17 As regards the generation and dissemination of products, the session noted that each RSMC in the region produced a large number of products on a daily basis. The processing of NWP guidance available from major centres at NMCs that do not operate their own NWP models for weather forecasting, has become much simpler now with the availability of low cost workstations. Graphical processing of grid point value (GPV) fields on workstations/PCs can be accomplished at many centres in the region with little investment. It should be possible to implement PC-based software to receive and process GRID products. RSMC New Delhi has developed a PC-based Fortran decoder for the GRID messages received on GTS. The PC-based decoding system is used as a backup in the event of an outage of the mainframe system for preparing operational products. The availability on the Internet of high-quality products from advanced high-resolution NWP systems operated by major GDPS centres within and outside the region has opened up new opportunities for NMHSs to enhance their capability in providing weather forecast service to the users.

5.18 The session also noted that although many products were available from major GDPS centres inside and outside the region (see Table 3 in the Annex VI) there were a lot of requirements for output products produced by other GDPS centres (see Table 4). The Rapporteur`s proposals on new cooperative activities to improve implementation of the GDPS in RA II based on the results of survey is given in section 6.3.

5.19 The session recalled that the eleventh session of Regional Association II had stated a requirement for specialised transport/dispersion model products to be made available to the Members in the Region in case of a nuclear accident. The Association had invited RSMCs Beijing, Tokyo and the Regional Operational Centre (ROC) Obninsk to develop their operational facilities in the area and demonstrate their capabilities to CBS-XI with a view to seeking designation as RSMCs with activity specialisation in the provision of transport model products for environmental emergency response. Following the presentations, CBS-XI recommended to EC the designation of the above centres as RSMCs with activity specialisation in transport model products. Furthermore, CBS responded to the requirement of several Members and the UN/OCHA (former DHA) for meteorological support services for chemical incidents and other non-nuclear emergencies with transboundary pollution through expanding the Emergency Response Activity Programme accordingly. The group felt that it would be desirable that RSMCs in the Region would take note of this requirement, tune their activities to develop and implement the necessary models.

Results of the annual global monitoring carried out in October 1998

5.20 The Secretariat received results of the 1998 annual global monitoring from 19 centres located in Region II. Twelve RA II centres provided monitoring results on electronic media.The Table A includes a short summary of the monitoring results. The percentages of reports received on the MTN, the percentages of so-called silent stations and the percentages of reports expected to be prepared at stations implemented in accordance with the information given in Volume A of WMO Publication No. 9 (the percentages are calculated with the Regional Basic Synoptic Network (RBSN) as the reference) are given in columns (a), (b) and (c) respectively.

Table A

	(a)	(b)	(c)
Type of data	Reports received	Silent stations	Reports expected to be prepared
SYNOP	79 per cent	5 per cent	95 per cent
Parts A of TEMP	60 per cent	16 per cent	88 per cent

5.21 The availability of SYNOP reports is relatively satisfactory while that of parts A of TEMP reports is less satisfactory. Less than 20 per cent of the expected SYNOP reports were received from Afghanistan, Cambodia, Iraq, Kuwait, Lao People's Democratic Republic, Republic of Yemen and Tajikistan. The availability of Parts A of TEMP reports is not satisfactory from the northern, south-eastern and western parts of the Region. There was a decrease of the availability of TEMP reports, in particular in the northern part of the Region from 1996 to 1998.

5.22 The session was concerned at the deterioration in the availability of TEMP reports, in particular in the northern part of the Region. This was primarily due to the financial difficulties met by the countries concerned when purchasing radiosondes. The session was informed that an upgrading of the upper-air observation programme was expected for the stations located in Russian Federation, but it would not be possible to resume the complete observation programme of the RBSN stations.

5.23 The session considered the action, which could be undertaken to reduce the number of silent stations. Through the WMO Voluntary Co-operation Programme, some countries in the northern part of the Region received support for the provision of radiosondes. However, the funds available under the VCP for the support of WWW Programme are limited, and it is important to define the priorities for the use of the funds to support the observing system (see section 6.6).

5.24 The comparison of the monitoring results provided by the NMCs, the associated RTHs and the MTN centres showed differences in the availability of the reports at those centres. Those differences could be due to differences in the implementation of the monitoring procedures or to difficulties in the relay of the data on the GTS. The session recommended to invite the RTHs to further consider this matter in co-ordination with their associated NMCs. In some instances, the number of reports from an NMC associated to two RTHs received by one of the RTHs was higher than the number of reports received by the other RTH. In such cases, that RTH should arrange for the routeing of the relevant bulletins from the other RTH, even if this may lead to the reception of some duplicated bulletins.

5.25 The meeting noted that reports were received although not mentioned as prepared in Volume A of WMO Publication No. 9. It recommended inviting all WWW centres to review and update the relevant information included in the WMO Publication No. 9. The meeting also noted some misunderstanding as regards the procedures applied to update the Volume A and to submit amendments to the list of RBSN stations, and requested the Secretariat to remind the Members of the existing relevant procedures.

6. REGIONAL ASPECTS OF THE WWW COMPONENTS AND SUPPORT FUNCTIONS, INCLUDING REPORTS BY THE RAPPORTEURS/CO-ORDINATOR (agenda item 6)

6.1 **Global Observing System** (agenda item 6.1)

6.1.1 The session expressed its appreciation to the report of Mr Chen Yongqing (China), the Rapporteur on the Regional Aspects of the GOS. It noted the results of several meetings attended by the Rapporteur and felt that appropriate proposals and recommendations of these meetings would provide an effective contribution to the GOS implementation and redesign activities in the region.

6.1.2 The meeting considered the proposal to the revision of the RBSN list prepared by the Rapporteur and agreed on the following principles used by the Rapporteur when compiling the new list of stations:

- The recent monitoring report shows that the availability of SYNOP and TEMP/PILOT reports from RBSN stations in Region II was not satisfactory. In order to obtain a better implementing level of the RBSN, the RBSN list should be updated in the light of density requirement and information available in Vol.A of WMO Publication No 9;

- The Manual on Global Observing System recommends that the requirements for horizontal resolution both surface stations and upper-air stations should be 250Km. For surface stations, denser network is required. The mean distance between two stations was used as 150Km for surface, and 250Km for upper-air stations;

- The current RBSN stations, which showed “silence” in the monitoring report, were carefully considered. If there was another RBSN station nearby, which has better availability of its reports, and the distance between them is less than 100Km, “silent”

station was excluded from the list. If no better RBSN station existed nearby, the "silent" station was kept in the list;

- In accordance with the mean distance (150Km), the software also select the proposed RBSN stations which are not current RBSN stations but included in Vol.A of WMO Publication No.9, so as to get observational data in data sparse areas. If the distance between two current RBSN stations was less than 20Km, the one, that has less data availability, is excluded from the list.

6.1.3 On the basis of above consideration, the revised RBSN list proposed by the Rapporteur includes 1191 surface stations, 302 radiosonde stations, and 34 radiowind stations. The session decided that this list should be checked and up-dated by individual Members of the Region. The meeting recommended that the Rapporteur, with the assistance of the Secretariat should distribute the proposed list of RBSN stations among RA II Members as appropriate and submit on behalf of the chairman of the working group the amended list to the twelfth session of RA II for approval.

6.2 **Global Telecommunication System** (agenda item 6.2)

6.2.1 The meeting noted with appreciation the report of Mr A.I. Gusev (Russian Federation), Co-ordinator of the Sub-group on the Regional Aspects of the GTS in RA II. His report included the outcomes of the Implementation Co-ordination Meeting on the GTS in Region II, which was held in Doha from 12 to 16 October 1999. The main issues regarding proposals for GTS improvement are given below.

Integration of MDD into the RMTN as an Inter-regional component

6.2.2 Ten centres in the western part of Region II received MDD. This showed that MDD played an important role in the distribution of data in this part of the Region. It was recalled that the MDD receiving systems had to be renewed to receive the programmes of the new generation of Meteosat satellites during the transition period 2001-2003.

6.2.3 The meeting agreed to recommend including MDD into the RMTN as an inter-regional component. The session felt that, as recommended by CBS-Ext. (98), a co-ordination mechanism should be developed to ensure that requirements of the user WWW centres of MDD in Region II were met to the largest extent possible. The session requested the Secretariat to seek the comments of the operator of MDD before the next session of Regional Association II on this question, and to inform the chairman of the Working Group of the comments received.

UKSF/WWW

6.2.4 A pilot project for the UKSF/WWW had been initialised; Bahrain, Macao and Sri Lanka were willing to participate in the pilot project. The pilot project will aim at evaluating the level of reception of the data and the adequacy of the transmission programme of the UKSF/WWW. The session noted that UK was preparing a document defining the objectives and the organisation of the pilot project. The Secretariat will dispatch this document to the RA II Members. The question of the life span of the UKSF/WWW beyond the present commitment to 2005 was raised. The meeting noted that UK would provide information in this respect in its document.

Operational Matters

6.2.5 RTHs Bangkok, Beijing, Jeddah, New Delhi and Tokyo have implemented their routing catalogues and the other RTHs planned to do so.

6.2.6 The MTN centres located in Region II, except RTH Jeddah, have started or will soon start to maintain their parts of the comprehensive catalogue of meteorological bulletins. WMC Moscow will maintain its part in its zone of responsibility (as an MTN centre), which includes the zones of responsibility of RTHs Khabarovsk and Novosibirsk. The session was of the opinion that RTH Jeddah should be invited to consider maintaining as soon as possible its part so that the comprehensive catalogue be achieved for the whole Region II. In a more general way, the session expressed the view that RTH Jeddah should more actively participate in the work of the Sub-group on Regional Aspects of the GTS in Region II.

6.2.7 The meeting noted with concern that seven centres (including RTHs Bangkok and Tehran) would not be ready to accept messages longer than the present limit (3800 octets) as from 6 November 2000. The session recalled that CBS recommended to implement length of the messages 15000 octets as from 6 November 2000, and that the recommendation of CBS was endorsed by the Executive Council. The session was of the opinion that it was important for Region II, as for any other Region, to be ready to implement this procedure well in time, which would make it possible to distribute new data, including climatological data and products, to all centres. The session requested the Secretariat to invite the centres concerned to provide further information on the difficulties met in the implementation of the procedure, to consider possible solutions to overcome those difficulties and, if required, to submit requests for assistance.

Requirements on the GTS in Region II

6.2.8 The analysis of the Strengths, Weaknesses, Opportunities and Threats (SWOT) with respect to the current RMTN, and the list of the requirements put on the RMTN is given in annex VII.

6.2.9 The meeting agreed that there was a serious threat on the future of the GTS if it failed to keep pace with technology and to address new requirements. This could lead the users to migrate to other networks outside WMO structure, redirect their investment and so undermine the GTS. The session stressed the importance of implementing an improved RMTN.

Study of the Replacement of HF Broadcasts by Satellite Systems

6.2.10 The meeting underlined the financial burden for the RTHs operating the HF broadcasts, which were not cost-efficient. Each GDPS centre in the Region was located in the area of coverage of one or several satellite distribution systems (see Annex V). The meeting noted that there was a major progress during the last years in the implementation of satellite receiving systems in GTS centres. Moreover, the results of the survey on the remaining requirements for HF broadcasts and alternative means showed that there were only a few remaining requirements for HF broadcasts expressed by RA II Members. The session felt that it was time to consider a date for the discontinuation of the HF broadcasts.

6.2.11 The meeting noted that there were still some requirements of the marine community to receive HF broadcasts. CBS-Ext. (98) felt that alternative means, like the use of Inmarsat distribution systems within the framework of the Global Maritime Distress and Safety System (GMDSS) or the access to data bases should be considered to distribute products

to ships. It felt that the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) was in the best position to determine the requirements of the maritime community in that respect, and to identify the most appropriate systems to meet them. The meeting agreed to invite the JCOMM to inform RA II of the results of its action in this respect.

Study of an Improved RMTN

6.2.12 The meeting agreed on the design of the transport network for an improved RMTN based on the implementation of several networks as given in Annex VIII. These networks would provide the transport service to support the connectivity required for the improved RMTN. There would be no change in the organisation of the RMTN.

6.2.13 The meeting felt that, taking into account the opportunities and threats mentioned in the SWOT table (see paragraph 6.2.6), a feasibility study of the improved RMTN as given above should start as soon as possible. It requested the Secretariat to invite all RA II Members to consider this study and to designate focal points for the feasibility study. The designated focal points of the RTHs should co-ordinate the feasibility study in co-operation with their associated NMCs. The designated focal points should work by correspondence (preferably via the Internet).

Radio-frequencies for Meteorological Activities

6.2.14 The 1997 World Radio-communication Conference (WRC-97, Geneva, October-November 1997) considered several items of concern for meteorology and had not reduced existing radio-frequency allocations to meteorological aids and meteorological satellites. WRC-97 also decided new regulatory provisions to meet most frequency requirements for meteorological and earth-exploration satellites, including space borne remote sensing, and for wind profiler radars. The active participation of WMO, including NMHSs experts and the WMO Secretariat, was instrumental in ensuring that meteorological issues had been recognised and supported at WRC-97.

6.2.15 The threat to the radio frequency bands allocated to Meteorological aids (radiosondes), and also to Met-Sat, is continuing at least until the next World Radiocommunication Conference (2000). The development of new systems (Low-Earth Orbiting satellites- LEOs) of the Mobile Satellite Service (MSS) is exerting pressure for new frequency allocation to MSS below 3 GHz, including in part of the band 401-406 MHz for “little LEOs” and of the band 1675-1690 MHz for “big LEOs”. WRC-97 urged ITU Member countries and requested ITU-R (Radiocommunication Study Group 7), with the participation of WMO, to assess the current and future spectrum requirements for Met-aids in the band 401-406 MHz, with a view to a possible removal out of the band 405-406 MHz.

6.2.16 The meeting noted with concern that any reduction of the bandwidth allocated to the radiosondes would require the use of more spectrum efficient radiosondes and would lead to an increase on the costs of the radiosondes.

6.2.17 The active participation of WMO, including NMHSs experts and the WMO Secretariat, and the effective co-ordination activities undertaken by the Steering Group on Radio-Frequency Co-ordination (SG-RFC) was instrumental in ensuring that meteorological issues had been recognised and supported in ITU-R. The meeting stressed the importance that WMO continue informing the NMHSs on the question, and that the NMHSs co-ordinate these issues with their national telecommunication administration.

6.3 **Global Data Processing System** (agenda item 6.3)

6.3.1 The session expressed its appreciation for the report of Dr Woo-Jin Lee (Republic of Korea), Rapporteur on the Regional Aspects of GDPS. The report was based on the results of survey on the capabilities of various GDPS centres in the Region and requirements for WWW products conducted by the Rapporteur. Most of these results were given in section 5 above.

6.3.2 In order to improve implementation of the GDPS in the Region the meeting agreed with the following proposals made by Members of RA II and submitted by Rapporteur:

(a) Regional data base to be established to provide access to high-resolution NWP products from major centers such as ECMWF, EGRR, KWBC etc. in addition to those of JMA over the Internet or ISDN;

(b) Training for development and utilization of NWP products to be provided to other Members;

(c) NWP models and products to be provided by advanced centers in compliance with Members' requests;

(d) Meteorological software should be exchanged on a regular basis;

(e) Highly equipped and more capable RSMCs/NMCs should assist other NMCs in the Region to improve their operational capabilities by providing support in communication and software development;

(f) More training should be provided in RA-II in order to improve the utility of NWP products.

6.3.3 The meeting considered proposals made by Rapporteur in respect to the emerging GDPS issues in RA II and agreed that a survey should be conducted among RA II Members on the following issues:

(a) Use of GDPS information, including GPV products from the Internet;

(b) Use of ensemble forecasts;

(c) Application of NWP outputs on industrial meteorology.

6.3.4 The meeting stressed the need to develop guidance for severe weather forecasting with nowcasting technique and/or high resolution NWP. The necessity to extend emergency response activities on chemical spills, forest fires and other accidents was also expressed.

6.4 **Data Management (DM), including Codes** (agenda item 6.4)

6.4.1 The meeting expressed its appreciation to Mr M. Sato (Japan) former Rapporteur on Regional Aspects of Data Management and to Mr A. Shimazaki (Japan), who replaced Mr Sato, for the comprehensive report, which covered the activity on Data Management in RA II. It noted that the Rapporteur has successfully carried out studies among the RA II Members on the following subjects:

Subject (1) To examine more effective monitoring procedures for the data reported by RBSN stations;

Subject (2) To undertake a survey of the current level of implementation of the use of BUFR for data reporting and capability to handle BUFR messages, and to collect and consolidate requirements on CREX of potential users and to undertake a feasibility study to introduce CREX for data exchange;

Subject (3) To study coding procedures for CLIMAT and CLIMAT TEMP reports and suggest clarifications to be introduced in the regional coding procedures;

Subject (4) To make an assessment of the problems likely to be faced by NMHSs in the computer software and hardware due to transition from the year 1999 to the year 2000;

Subject (5) To undertake an impact study on the potential use of the Internet with a view to enhancing the capability of NMHSs.

6.4.2 As regards the results of the study on subject (1) the group was informed that the proposals were provided to an appropriate CBS team for developing more effective monitoring procedures.

6.4.3 The meeting was also informed on the results of the survey on subject (2), which indicated that there seems to be no practical plan, in general, to introduce the BUFR/CREX for data reporting in the Region. For the purpose of introducing BUFR/CREX codes, however, 85.7% (the largest number) of respondents pointed out the necessity of the "guidance materials on CREX messages", and 78.6% "information on the availability of decoding/encoding software". Furthermore, no respondents opposed the migration from character codes to BUFR/CREX. 43% of the respondents supported the migration to be promoted, and 50% showed a positive standpoint for the migration, in total. On the other hand, 57% expressed difficulty to accept a quick migration. The prevailing reasons for the difficulties were, "no telecommunication circuits to accommodate binary data in BUFR code" (43%) and "unavailability of decoding/encoding software" (43%).

6.4.4 Taking the above results and the relevant agreement of CBS-Ext. (98) into consideration, the working group felt that it was indispensable for the realisation of the migration to prepare the guidance materials that explained in simple terms the advantages of table-driven codes and the characteristics of GRIB, BUFR/CREX decoding/encoding software. The group therefore proposed that the CBS plan to establish a "software support office" be encouraged by the RA II. It stressed that in order to avoid confusion, all RA II Members should implement the migration in a coordinated manner.

6.4.5 The meeting expressed the view that there was a need for standardisation of Table-based codes forms in regard to their structure, so as to ensure a smooth evolution process of these codes in light of evolving requirements. For instance, there have been several changes or revised editions of GRIB, which required modifications of encoding and decoding software that posed a significant burden on centres concerned. The group therefore recommended that actions be initiated towards standardising GRIB.

6.4.6 The meeting noted with concern the poor reporting rate of CLIMAT and CLIMAT TEMP reports revealed by the survey on subject (3). It expressed the opinion that choosing the RBSN as target network for CLIMAT reporting stations recommended by CBS had resulted in low availability of these reports in Region II as well as in other Regions due to difficulties that Members were experiencing in the implementation of this recommendation. The group requested that the chairman communicate with the president of CBS suggesting a replacement of the adopted target network by an alternative network. A list of stations proposed for an alternative network should include the GSN and GUAN stations and be

supplemented by other CLIMAT reporting stations needed for regional purposes and selected through the same criteria that were used for the selection of the GSN stations. Depending on the position to be taken by CBS, the Rapporteur on Regional Aspects of Data Management in RA II was expected to develop a proposal on a so-called Regional Network of CLIMAT Reporting Stations for submission to the twelfth session of RA II.

6.4.7 The meeting also noted that besides the low reporting rate, there was another problem regarding CLIMAT/CLIMAT TEMP reports. Although RA II established the regional coding practices aiming to decrease coding errors, there were still many erroneous data. It is therefore doubtful that more detailed regulations on coding would help to diminish the amount of erroneous data. Instead, the inclusion of coding examples in the manuals would be more effective to help users apply the regulations and thus decrease the errors made.

6.4.8 The meeting was informed on the results of the survey on the use of the Internet. At the time of the survey, 15 Members out the 17 who responded stated that they had already access to the Internet, 12 Members among them used the Internet to receive the data and products from other NMHSs almost regularly. On the other hand, 9 Members provided other bodies with their data or products via the Internet. The group felt that the Internet should be used as a backup measure for the GTS.

6.4.9 The meeting considered a proposal for the regional exchange of *in-situ* observations of snow depth over the GTS submitted by the GCOS Atmospheric Observation Panel for Climate. It agreed that in view of the importance of snow depth data for climate monitoring and research and following the policy of other WMO Regions, an amendment to the Manual on Codes should be submitted to the twelfth session of RA II as follows:

"Snow depth shall be reported by all stations capable of doing so, and included at least once a day using the group (4E`sss) in section 3 of SYNOP code"

6.5 **Operational Information Services (OIS)** (agenda item 6.5)

6.5.1 The session was briefed on the WWW Operational Information Service activity, and in particular on the restructuring of the Service. In considering the issue the group made several proposals to improve the Service:

(a) To prepare a CD-ROM containing WMO Publications such as Vols. A, C1, etc;

(b) To provide WMO Publications on Web site;

(c) To investigate the possibility to reformat Vol A in order to simplify the downloading process;

(d) To include in Vol A information regarding RBSN, GSN or GUAN stations.

6.5.2 The group noted that as part of their responsibilities, WMCs and RTHs on the MTN should review the catalogue of meteorological bulletins and notify the Secretariat, which is tasked with issuing regularly the updated editions of Publication No. 9-Volume C1, of changes to be included in that publication. Work is currently in progress at the Secretariat to allow more efficient updating of the catalogue as regards bulletins from zones of responsibility of various RTHs. It stressed that the objective of the OIS cannot be achieved unless changes to be reflected in relevant publications are communicated to the Secretariat promptly. In this connection the designated RTH focal points and Members are urged to assist the Secretariat in keeping WWW operational publications current by ensuring that all

changes reach the Secretariat without delay, and to thus benefit from the restructured OIS for access to the up-to-date information required for their operations.

6.6 **Technical Cooperation activities related to WWW** (agenda item 6.6)

6.6.1 The meeting was informed on the implementation of Voluntary Co-operation Programme (VCP) projects related to the WWW in RA II and on the VCP requests submitted by WMO Members in RA II which have not yet received full support. It noted that within the framework of the VCP, fifteen countries in RA II received full or partial support for a total of 21 VCP projects (training projects excluded) related to the WWW during the period 1998-1999. Of these projects, fifteen are in the process of being implemented and six projects were completed. Nine were aimed at strengthening upper-air observing stations, five at strengthening surface observing stations, one at installing a satellite receiving station, four at improving the GTS, and two were related to the improvement of the GDPS.

6.6.2 At the same time the meeting expressed its concern that as on 15 September 1999, 46 VCP requests relating to the WWW submitted by eighteen Members in RA II have not yet received full support. Of these requests, 14 are related to upper-air observing stations, six related to surface observing stations, three related to satellite receiving stations, and four are related to the maintenance of the equipment. Sixteen requests are for the improvement of the GTS and three are for the improvement of the GDPS.

6.6.3 In prioritising the assistance for VCP projects the group based its recommendation on the idea that the highest priority should be given to the projects, the realisation of which would have the greatest impact on the implementation of the WWW on regional and global scales. Following this, the highest priority was given to the projects related to the improvement of the upper-air network in data-sparse areas in the region, in particular in its central and northern parts. Taking into account the proposal of RA II ICM on GTS, the group also decided to give equally high priority to the activities related to the establishment of GTS connection of NMCs not yet implemented and upgrading national data collection where monitoring results had revealed deficiencies.

6.6.4 As regards the automation of GTS facilities at NMCs, assistance in this area should be considered with a high priority together with the upgrading to medium speed of the connections of the NMCs to their associated RTHs. Projects related to the data-processing system would have medium priority for assistance.

7. PUBLIC WEATHER SERVICES (agenda item 7)

7.1 The group received with appreciation the report of Dr. A.A. Liakhov (Russian Federation), Rapporteur on Regional Aspects of Public Weather Services on the activity in this area.

7.2 The group felt that there is a strong need for continuing assistance to Members in RA II in dealing with issues which increasingly concern them including:

- The use of the Internet as a tool to disseminate public warnings and forecasts;
- Effective cooperation with major international media;
- Capacity building for provision of improved public weather services;
- Exchange of warnings of severe weather among neighbouring countries;

- Improved relations and co-ordination between NMSs, disaster co-ordinators, media, and private sector.

7.3 In order for RA II Members to further develop national PWS programmes, it is proposed that they be provided with:

- Guidance material for enhanced public understanding and, if possible, including quantitative assessments, of the impact and benefits of meteorological services on national economies and on the safety of life and protection of property, as well as for the role and ability of NMSs.

- Guidance material on the harmonisation of the exchange of severe weather warnings between neighbouring countries, prepared in consultation with appropriate Tropical Cyclone bodies;

- Guidance material for improving the presentation of warnings and forecasts through various media (including TV presentation);

- Guidance material on verification of public weather forecasts;

- Training through PWS regional workshops and seminars dealing with aspects of the programme, which are of special concern and interest to the Region as outlined above.

8. INTERNATIONAL EXCHANGE OF DATA AND PRODUCTS (agenda item 8)

8.1 The meeting was informed that 39 Members as well as ECMWF and EUMETSAT had notified the Secretary-General regarding their plans or actions related to the implementation of Res. 40 (Cg-XII) (see table given in Annex IX). The notifications can be categorized as follows:

(a) Members declared that they do not intend to place conditions on any data and products in case of their re-export for commercial purposes;

(b) Members identified their "additional" data or products on which they placed conditions for the re-export for commercial purposes and stipulated generic conditions attached thereto;

(c) Members identified their "additional" data or products on which they placed conditions for the re-export for commercial purposes;

(d) Members included new data or products under the category “additional” with a view to expanding their range of data and products to be exchanged over the GTS.

8.2 The meeting confirmed that there were no difficulties in previous years in the implementation of Resolution 40 (Cg.XII) by RA II Members. The meeting expressed the opinion that it would be highly desirable to have more ECMWF products available on the GTS and encouraged ECMWF to increase a number of products that would be available without any conditions.

8.3 The meeting was informed that Thirteenth Congress agreed that a survey among all Members should be carried out to assess any increase in data availability related to the adoption of Resolution 40 (Cg-XII). The survey should collect information from each

Member on what changes, if any, it has implemented in the volume of meteorological and related data and products made available on the GTS from the years around the adoption of Resolution 40. In addition, the survey should also collect information on whether Members believed that they have been receiving, or had access to, more data and products as a result of the implementation of Resolution 40. The president of CBS has arranged for development of questionnaires to conduct this survey. The responses are requested by 1 December 1999.

9. YEAR 2000 PROBLEM (agenda item 9)

9.1 The meeting considered the Year 2000 Problem and the situation regarding efforts to ensure the World Weather Watch continues to provide essential data, products and services on 1 January 2000 and beyond as given in the Annex X. The Members were pleased to note that much progress had been made to ensure meteorological systems were ready, and noted with appreciation the detailed report submitted by JMA on their Y2K status and backup arrangements. However, they were concerned that the status of several Members was not known since they had not responded to any of the numerous requests for this information issued over the past two years by the Secretary-General. The meeting emphasised that there are risks for the interruption of the transmission on circuits, in particular low-speed circuits. The Working Group urged all Members, who have not yet responded, to inform the Secretariat of their Y2k status urgently.

9.2 The meeting noted with satisfaction the monitoring and contingency plan developed by an expert team of CBS following the request by EC. The meeting thought that it would be necessary that all Members receive information on the results of the monitoring so that they would be prepared to advise the government and media on the global and regional status of the GTS, even if there was no problem incurred in their own NMHS.

9.3 The meeting recalled the backup arrangements through FTP servers to be provided by Melbourne, Offenbach, Tokyo, and Washington. It was however concerned that not all NMCs have the capability to access FTP and recommended that Members make efforts, where necessary, to attain such access capabilities before the end of the year.

9.4 The meeting stressed that each NMC should consult with its associated RTH to plan for reliable procedures to provide a back-up means (e.g. the Internet) to transmit and receive data in case of suspension of the transmission on the circuit linking the NMC and the associated RTH. Any planned back-up procedures should be tested no later than mid-December 1999.

10. FUTURE WORK PROGRAMME (agenda item 10)

10.1 The meeting was informed that the twelfth session of Regional Association was planned to be held in the second half of 2000. It decided that in the course of preparing for the session, the Working Group activities should be focused on the following major issues identified in the report above:

(i) To review the RBSN station list in light of the remarks made by the session, taking into consideration the strategy for silent stations and stations reporting but not included in the RBSN. To distribute among RA II Members proposals concerning the revision of the RBSN prepared by the Rapporteur on Regional Aspects of GOS and adopted by the session in order to seek their concurrence or amendments; to submit updated draft proposals to the session of RA II;

(ii) To communicate with president of CBS, suggesting a replacement of adopted

target network of CLIMAT reporting stations by an alternative network. Depending on position of CBS, Rapporteur on Regional Aspects of Data Management may be requested to develop proposal on so-called Regional Network of Climat reporting stations for submission to the twelfth session of RA II;

(iii) To monitor the availability of CLIMAT and CLIMAT TEMP reports from the GSN and GUAN stations in the Region and take appropriate actions as mentioned in paragraph 4.7;

(iv) To review the status of pilot project of UKMO in regard to use of UKSF for WWW in RA II;

(v) To review the status of maintenance, updating and exchange of the catalogues of meteorological messages in various RTHs;

(vi) To continue study on the improvement of RMTN in RA II;

(vii) To keep under watch the status of Y2k compliance of operational systems in RA II and provide necessary assistance to Members as required

(viii) To assess the data processing requirements of NMCs in the region not equipped with any automated systems and provide necessary assistance to them to acquire the minimum level of data processing capability;

(ix) To make necessary arrangements for providing high resolution NWP output products to Members for severe weather warning guidance from within the Region;

(x) To review the migration strategy from alphanumeric codes to table-driven codes with a new data flow scheme proposed by the CBS Expert Team on evolution of data. To provide comments to Rapporteur on Data Management and to make an appropriate proposal to the CBS, if necessary;

(xi) To conduct surveys on the use of GDPS information, including GPV products from the Internet, on the use of ensemble forecasts, and on applications of NWP outputs on industrial meteorology.

11. CLOSURE OF THE SESSION (agenda item 11)

11.1 Before closing the session, chairman of the working group expressed his appreciation to the active participation of the members in the deliberations of the meeting, which contributed to the remarkable results achieved by the meeting. He extended his thanks to the Secretariat for their valuable assistance, and, in particular to Dr Ali Hamid Al-Mulla and his staff for the excellent arrangements provided. Mr Gusev (Russian Federation) and Mr D. Schiessl, Director for Basic Systems joined him in his remarks addressed to the host country. They also thanked Mr Prasad for the excellent chairing of the meeting.

11.2 The meeting was closed on Thursday, 21 October 1999 at 13:00.

Annex I

LIST OF PARTICIPANTS

Mr Abdullah J. Al Haddad
Department of Civil Aviation and Meteorology
P.O. Box 3000
Doha
Qatar
Tel.: (974) 314 380 or 314 378
Fax: (974) 673 243

Mr Ahmed Hamoud Al-Harthy
Chief, Operational and Technical Services Section
Directorate General of Civil Aviation and Meteorology
P.O. Box 1, Postal Code 111
SEEB International Airport
Sultanate of Oman
Tel. : (968) 519 649
Fax: (968) 519 363
Email: forecast@dgcam.com

Dr Ali Hamed Al-Mulla
Deputy Director
Department of Civil Aviation and Meteorology
P.O. Box 3000
Doha
Qatar
Email: aliali96@qatar.net.qa

Mr Behnam Joo M.J.
Iran Meteorological Organization
Department of Telecommunication
P.O. Box 13185-461
Tehran Mehrabad
Islamic Republic of Iran
Tel.: (9821) 600 12 30
Fax: (9821) 646 90 42
Email: irimo@dpi.com

Mr D. Chakrabarti
Telecommunication Division
India Meteorological Department
Mausam Bhavan, Lodi Road
New Delhi-110003
India
Tel. : (9111) 469 31 86
Fax: (9111) 469 92 16 or 462 32 20
Email: dulal@imd.ernet.in

Mr Chen Yongqing
Rapporteur on the Regional Aspects of the Global Observing System
China Meteorological Administration
46 Baishiqiaolu
Beijing
China
Tel.: (8610) 684 064 21
Fax: (8610) 621 747 97
Email: jczw5@rays.cma.gov.cn

Mrs Davaasyren, Tungalag
Ministry of Nature and the Environment
Khudaldaany Gudamj 5
Ulaanbaatar 11
Mongolia
Tel. : (9761) 32 80 35
Fax: (9761) 32 66 11/32 99 68
Email:tungalag@yahoo.com

Mr V.G. Davydov
Main Administration of Hydrometeorology
72 Observatorskaya Street
Tashkent 700052
Uzbekistan
Tel. : (998) 711 33 20 25
Fax: (998) 711 33 20 25
Email: davydov@meteo.uz

Mrs Duong Lien Chau
Hydrometeorological Service
4 Dang Thai Than Street
Hanoi
Socialist Republic of Vietnam
Tel. : (844) 825 42 78
Fax: (844) 825 42 78
Email: met_srf@fpt.vn

Dr P. Govinda Rao
Department of Civil Aviation and Meteorology
P.O. Box 3000
Doha
Qatar
Fax: (974) 40 27 12
Email: grpitta@yahoo.com

Mr A.I. Gusev
Russian Federal Service for Hydrometeorology & Environmental Monitoring
12 Novovagankovsky Street
Moscow 123242
Russian Federation
Tel.: (7095) 205 48 13 or 255 24 87
Fax: (7095) 253 94 84 or 255 24 14
Email: tuboss@mskw.mecom.ru

Mr Kashiwagi, Keiichi
Japan Meteorological Agency
1-3-4 Otemachi, Chiyodaku
Tokyo 100
Japan
Tel. : (814) 21 93 64 66
Fax: (814)24.93.60.56
Email: kashiwagi@naps.kishou.go.jp

Dr Lee, Woo-Jin
Rapporteur on the Regional Aspects of the GDPS, Numerical Weather Prediction Division, Korea Meteorological Administration
460-18, Shindaebang 2-dong, Tongjak-gu
Seoul 156-720
Korea
Tel.:(822)836 54 73
Fax: (822) 836 54 74
Email: wjlee@nwpsvr.kma.go.kr

Mr A.A. Lyakhov
Rapporteur on the Regional Aspects of Public Weather Services
Hydrometeorological Bureau of Moscow & Moscow Region
9-13 Bolshoy Predtechensky Pereulok
Moscow-123242
Russian Federation
Te.: (7095) 255 13 54
Fax: (7095) 255 15 82
Email: liakhov@hydromet.ru

Mr Kanti Prasad
Chairman of the RA II Working Group on PIW
India Meteorological Department
Mausam Bhavan
Lodi Road
New Delhi - 110003
India
Tel.: (9111) 461 10 68
Fax: (9111) 469 92 16
Email: kpasad@imd.ernet.in

Mr Jassim A. Raddi
Head of Forecast and Analysis
Department of Civil Aviation and Meteorology
P.O. Box 3000
Doha
Qatar

Mr Atsushi Shimazaki
Rapporteur on the Regional Aspects of Data Management
Japan Meteorological Agency
1-3-4 Otemachi, Chiyodaku
Tokyo
Japan
Tel.: (813) 32 18 38 25
Fax: (813) 32 11 84 04
Email: shimazaki@met.kishou.go.jp

Mr V.I. Sokolik
1 Karasuiskaya Street
Bishkek 720017
Kyrgyz Republic
Tel. : (73312) 21 45 53
Fax: (73312) 214 43 22
Email : kgmeteo@kyrgyzmeteo.elcat.kg

Mr Wai Hon-gor
Hong Kong Observatory
134A Nathan Road
Hong Kong
Tel.: (852) 55 83 26 29
Fax: (852) 23 11 94 48
Email: hgwai@hko.gsn.gov.hk

Mr Yu Ji Xin
China Meteorological Administration
46 Baishiqiaolu
Beijing
China
Tel. : (8610) 68 40 62 42
Fax: (8610) 62 18 54 79
Email: yujx@rays.cma.gov.cn

WMO Secretariat

Mr D.C.Schiessl, Director for Basic Systems
Mr E.H. Al-Majed, Regional Director for Asia and South-Pasific
Mr E.I.Sarukhanian, Chief, Observing System Division

Annex II

AGENDA

1. OPENING OF THE SESSION

2. ORGANIZATION OF THE SESSION

2.1 Adoption of the agenda
2.2 Other organizational questions

3. REPORT OF THE CHAIRMAN OF THE WORKING GROUP

4. CONSIDERATION OF THE DECISIONS OF THE ELEVENTH SESSION OF RA II, CBS EXTRA-ORDINARY SESSION (1998), THIRTEENTH CONGRESS AND EC-LI INCLUDING REQUIREMENTS FOR WWW SUPPORT TO OTHER PROGRAMMES

5. STATUS OF WWW IMPLEMENTATION AND OPERATION

6. REGIONAL ASPECTS OF THE WWW COMPONENTS AND SUPPORT FUNCTIONS, INCLUDING REPORTS BY THE RAPPORTEURS/CO-ORDINATOR

6.1 Global Observing System (GOS)
6.2 Global Telecommunications System (GTS)
6.3 Global Data-processing System (GDPS)
6.4 WWW Data Management (DM), including Codes
6.5 Operational Information Service (OIS)
6.6 Technical Co-operation activities related to WWW

7. PUBLIC WEATHER SERVICES

8. INTERNATIONAL EXCHANGE OF DATA AND PRODUCTS

9. YEAR 2000 PROBLEM

10. FUTURE WORK PROGRAMME

11. CLOSURE OF THE SESSION

_____

Annex III

List of Stations for the GCOS Surface Network (GSN)

Region II

Station Index	Station Name	Latitude		Longitude**	
Afghanistan					
40930*	NORTH-SALANG	35°	19’	69°	01’
Bahrain					
41150	BAHRAIN AP	26	16	50	39
China					
50527	HAILAR	49	13	119	45
50745	QIQIHAR	47	23	123	55
51076	ALTAY	47	44	88	05
51463	URUMQI	43	47	87	37
51709	KASHI	39	28	75	59
51777	RUOQIANG	39	02	88	10
51828	HOTAN	37	08	79	56
52203	HAMI	42	49	93	31
52533	JIUQUAN	39	46	98	29
52836	DULAN	36	18	98	06
52889	LANZHOU	36	03	103	53
53068	ERENHOT	43	39	112	00
53614	YINCHUAN	38	29	106	13
53772	TAIYUAN	37	47	112	33
54342	SHENYANG	41	46	123	26
54511	BEIJING	39	56	116	17
54857	QINGDAO	36	04	120	20
55591	LHASA	29	40	91	08
56137	QAMDO	31	09	97	10
56294	CHENGDU	30	40	104	01
56571	XICHANG	27	54	102	16
56739	TENGCHONG	25	07	98	29
56985	MENGZI	23	23	103	23
57036	XI'AN	34	18	108	56
57083	ZHENGZHOU	34	43	113	39
57461	YICHANG	30	42	111	18
57745	ZHIJIANG	27	27	109	41
57993	GANZHOU	25	51	114	57
58362	SHANGHAI	31	12	121	24
58606	NANCHANG	28	36	115	55
59287	GUANGZHOU	23	08	113	19
59316	SHANTOU	23	24	116	41
59431	NANNING	22	49	108	21
59758	HAIKOU	20	02	110	21
India					
42027	SRINAGAR	34	05	74	50
42083	SHIMLA	31	06	77	10
42165	BIKANER	28	00	73	18
42182	NEW DELHI SAFDARJUNG	28	35	77	12
42295	DARJEELING	27	03	88	16
42410	GUWAHATI	26	06	91	35
42515	CHERRAPUNJI	25	15	91	44
42539	DEESA	24	12	72	12

Station Index	Station Name	Latitude		Longitude**	
42587	DALTONGANJ	24	03	84	04
42671	SAGAR	23	51	78	45
42731	DWARKA	22	22	69	05
42779	PENDRA ROAD	22	46	81	54
43041	JAGDALPUR	19	05	82	02
43063	PUNE	18	32	73	51
43128	HYDERABAD AP	17	27	78	28
43279	CHENNAI MINAMBAKKAM	13	00	80	11
43295	BANGALORE	12	58	77	35
43333	PORT BLAIR	11	40	92	43
43339	KODAIKANAL	10	14	77	28
43363	PAMBAN	9	16	79	18
43369	MINICOY	8	18	73	09
Islamic Republic of Iran					
40706	TABRIZ	38	05	46	17
40745	MASHHAD	36	16	59	38
40841	KERMAN	30	15	56	58
40848	SHIRAZ	29	32	52	35
Iraq					
40665*	KUT-AL-HAI	32	10	46	03
Japan					
47420	NEMURO	43	20	145	35
47421	SUTTSU	42	48	140	14
47585	MIYAKO	39	39	141	58
47600	WAJIMA	37	23	136	54
47648	CHOSHI	35	44	140	52
47678	HACHIJOJIMA	33	06	139	47
47740	SAIGO	36	12	133	20
47778	SHIONOMISAKI	33	27	135	46
47800	IZUHARA	34	12	129	18
47821*	ASOSAN	32	53	131	05
47827	KAGOSHIMA	31	33	130	33
47909	NAZE	28	23	129	30
47918	ISHIGAKIJIMA	24	20	124	10
47936	NAHA	26	12	127	41
47945	MINAMIDAITOJIMA	25	50	131	14
47971	CHICHIJIMA	27	05	142	11
47991	MINAMITORISHIMA	24	18	153	58
Kazakstan					
28952	KUSTANAI	53	13	63	37
29807	IRTYSSK	53	21	75	27
35078	ATBASAR	51	49	68	22
35394	KARAGANDA	49	48	73	09
35416	UIL	49	04	54	41
35796	BALHASH	46	48	75	05
35849	KAZALINSK	45	46	62	07
35925	SAM	45	24	56	07
36177	SEMIPALATINSK	50	25	80	18
36535	KOKPEKTY	48	45	82	22
36859	PANFILOV	44	10	80	04
36870	ALMATY	43	14	76	56
38001	FORT SEVCENKO	44	33	50	15
35108*	URALSK	51	15	51	17
35358	TORGAI	49	38	63	30
35576	KZYL-ZAR	48	18	69	39

Station Index	Station Name	Latitude		Longitude**	
Democratic People's Republic of Korea					
47014*	CHUNGGANG	41	47	126	53
Republic of Korea					
47112*	INCHON	37	29	126	38
47115*	ULLUNGDO	37	29	130	54
47165*	MOKP'O	34	47	126	23
Kuwait					
40582	KUWAIT AP	29	13	47	59
Kyrgyz Republic					
36974	NARYN	41	6	75	59
Sri Lanka					
43473	NUWARA ELIYA	6	58	80	46
43497	HAMBANTOTA	6	07	81	08
Maldives					
43555	MALE	4	12	73	32
Mongolia					
44212	ULAAN-GOM	49	59	92	05
44218	HOVD	48	01	91	34
44231	MUREN	49	34	100	10
44239	BULGAN	48	48	103	33
44259	CHOIBALSAN	48	05	114	33
44272	ULIASTAI	47	45	96	51
44288	ARVAIHEER	46	16	102	47
44317	ERDENE-TSAGAAN	45	53	115	22
44341	MANDALGOBI	45	46	106	17
44373	DALANZADGAD	43	58	104	41
Myanmar					
48042	MANDALAY	21	59	96	06
48062	SITTWE	20	08	92	53
48097	YANGON	16	46	96	10
Oman					
41254	SAIQ	23	04	57	39
41288	MASIRAH	20	40	58	54
41316	SALALAH	17	02	54	05
Pakistan					
41560	PARACHINAR	33	52	70	05
41620	ZHOB	31	21	69	28
41640	LAHORE CITY	31	33	74	20
41712	DAL BANDIN	28	53	64	24
41759	PASNI	25	16	63	29
41764	HYDERABAD AP	25	23	68	25
Russian Federation					
20046	POLARGMO IM. E.T.	80	37	58	03
20069	OSTROV VIZE	79	30	76	59
20087	OSTROV GOLOMJANNYJ	79	33	90	37
20274	OSTROV UEDINENIYA	77	30	82	12
20292	GMO IM.E.K. FEDOROVA	77	43	104	18
20353	MYS ZELANIJA	76	57	68	33
20667	IM. M.V. POPOVA	73	20	70	03
20674	OSTROV DIKSON	73	30	80	24
20744	MALYE KARMAKULY	72	22	52	42
20891	HATANGA	71	59	102	28
21432	OSTROV KOTEL'NYJ	76	00	137	52
21504	OSTROV PREOBRAZENIJA	74	40	112	56

Station Index	Station Name	Latitude		Longitude**	
21647	MYS SALAUROVA	73	11	143	14
21921	KJUSJUR	70	41	127	24
21931	JUBILEJNAJA	70	46	136	13
21946	COKURDAH	70	37	147	53
21965	OSTROV CHETYREH-STOLBOV	70	38	162	29
21982	OSTROV VRANGELJA	70	59	-178	29
23074	DUDINKA	69	24	86	10
23146	MYS KAMENNYJ	68	28	73	35
23205	NAR'JAN-MAR	67	38	53	02
23330	SALEHARD	66	32	66	40
23405	UST'-CIL'MA	65	26	52	16
23472	TURUHANSK	65	47	87	56
23552	TARKO-SALE	64	55	77	49
23631	BEREZOVO	63	56	65	03
23711	TROICKO-PECERSKOE	62	42	56	12
23724	NJAKSIMVOL'	62	26	60	52
23804	SYKTYVKAR	61	43	50	50
23884	BOR	61	36	90	01
23891	BAJKIT	61	40	96	22
23914	CERDYN'	60	24	56	31
23933	HANTY-MANSIJSK	61	01	69	02
23955	ALEKSANDROVSKOE	60	26	77	52
24105	ESSEJ	68	28	102	22
24125	OLENEK	68	30	112	26
24143	DZARDZAN	68	44	124	00
24266	VERHOJANSK	67	33	133	23
24329	SELAGONCY	66	15	114	17
24343	ZHIGANSK	66	46	123	24
24382	UST'-MOMA	66	27	143	14
24507	TURA	64	16	100	14
24641	VILJUJSK	63	46	121	37
24671	TOMPO	63	57	135	52
24688	OJMJAKON	63	15	143	09
24738	SUNTAR	62	09	117	39
24817	ERBOGACEN	61	16	108	01
24908	VANAVARA	60	20	102	16
24944	OLEKMINSK	60	24	120	25
24959	JAKUTSK	62	01	129	43
24966	UST'-MAJA	60	23	134	27
25173	MYS SMIDTA	68	54	-179	22
25248	ILIRNEJ	67	15	167	58
25325	UST'-OLOJ	66	33	159	25
25399	MYS UELEN	66	10	-169	50
25400	ZYRJANKA	65	44	150	54
25551	MARKOVO	64	41	170	25
25563	ANADYR'	64	47	177	34
25594	BUHTA PROVIDENJA	64	25	-173	14
25703	SEJMCHAN	62	55	152	25
25744	KAMENSKOE	62	26	166	05
25821	NAJAHAN	61	55	158	59
25913	MAGADAN	59	33	150	47
25954	KORF	60	21	166	00
28064	LEUSI	59	37	65	43
28138	BISER	58	31	58	51

Station Index	Station Name	Latitude		Longitude**	
28275	TOBOL'SK	58	09	68	15
28493	TARA	56	54	74	23
28661	KURGAN	55	28	65	24
28698	OMSK	55	01	73	23
28722	UFA	54	43	55	50
29231	KOLPASEVO	58	19	82	57
29263	ENISEJSK	58	27	92	09
29282	BOGUCANY	58	23	97	27
29612	BARABINSK	55	20	78	22
29698	NIZNEUDINSK	54	53	99	02
29838	BARNAUL	53	26	83	31
29866	MINUSINSK	53	42	91	42
30054	VITIM	59	27	112	35
30230	KIRENSK	57	46	108	04
30372	CARA	56	54	118	16
30393	CUL'MAN	56	5	124	52
30554	BAGDARIN	54	28	113	35
30635	UST'-BARGUZIN	53	25	109	01
30673	MOGOCA	53	45	119	44
30692	SKOVORODINO	54	00	123	58
30710	IRKUTSK	52	16	104	19
30879	NERCINSKIJ ZAVOD	51	19	119	37
30925	KJAHTA	50	22	106	27
30949	KYRA	49	34	111	58
30965	BORZJA	50	24	116	31
31004	ALDAN	58	37	125	22
31088	OHOTSK	59	22	143	12
31168	AJAN	56	27	138	09
31253	BOMNAK	54	43	128	56
31329	EKIMCAN	53	04	132	59
31369	NIKOLAEVSK-NA-AMURE	53	09	140	42
31416	IM POLINY OSIPENKO	52	25	136	30
31707	EKATERINO-NIKOL'SKOE	47	44	130	58
31735	HABAROVSK	48	31	135	10
31829	MYS ZOLOTOJ	47	19	138	59
31909	TERNEJ	45	00	136	36
31960	VLADIVOSTOK	43	07	131	56
32098	PORONAJSK	49	13	143	06
32195	SIMUSIR	46	51	151	52
32252	UST'VAJAMPOLKA	58	30	159	10
32389	KLJUCI	56	19	160	50
32411	ICA	55	35	155	35
32618	NIKOL'SKOE	55	12	165	59
35121	ORENBURG	51	41	55	06
No index	OKTIABR'SKAYA	52	40	156	14
Saudi Arabia					
40361	AL-JOUF	29	47	40	06
40394	HAIL	27	26	41	41
40430	MADINAH	24	33	39	42
40438	RIYADH	24	43	46	44
41024	JEDDAH KING ABDUL AZIZ	21	43	39	11
41141	GIZAN MARINE	16	54	42	32
Tajikistan					
38933	KURGAN-TYUBE	37	50	68	47
38954	KHOROG	37	30	71	30

Station Index	Station Name	Latitude		Longitude**	
Thailand					
48303	CHIANG RAI	19	55	99	50
48400	NAKHON SAWAN	15	48	100	10
48407	UBON RATCHATHANI	15	15	104	52
48462	ARANYAPRATHET	13	42	102	35
48500	PRACHUAP KHIRIKHAN	11	50	99	50
48568	SONGKHLA	7	12	100	36
Turkmenistan					
38507	TURKMENBASHI (KRASNOVOD)	40	00	53	00
38750	ESENGYLY (GASAN-KULI)	37	28	53	59
38763	GYZYLARBAT (KIZYL-ARVAT)	38	59	56	16
38895	BAJRAMALY	37	36	62	11
38915	CHARSHANGA	37	31	66	01
United Arab Emirates					
41196	SHARJAH AP	25	20	55	31
Uzbekistan					
38262	CIMBAJ	42	57	59	49
38413	TAMDY	41	44	64	37
38457	TASHKENT	41	16	69	16
Viet Nam					
48855	DA NANG	16	02	108	11
48900	HO CHI MINH	10	49	106	40

*) Subject to approval by Permanent Representative
**) Minus (-) means Southern Latitude or Western Longitude

TABLE A

STATUS OF IMPLEMENTATION OF GTS CIRCUITS AND PLANS

1. The status of implementation of GTS circuits and plans are given in following tables under columns (a) to (h). For each circuit identified by its two ends in column (a), the tables include two lines: the present status is given in the first line and the plan(s) in the second line.

2. The type of GTS circuit is given in column (b):

- A: for circuits of the Main Telecommunication Network (MTN),
- B: for main regional circuits,
- C: for regional and supplementary regional circuits,
- D: for interregional and supplementary interregional circuits,
- X: for additional circuits.

3. The constitution of the circuit is given in column (c):

- Cab: for cable circuits,
- HF: for HF circuits,
- Mcw: for microwave circuits,
- Sat: for satellite circuits,
- N/O: for circuits not in operation.

4. For circuits on which several channels are multiplexed, the total speed of the circuit is given in column (d).

5. For the circuit or for each channel of the multiplexed circuits, the following information is provided in four columns under (e) to (f);

(i) speed of transmission

(ii) Type of data exchanged:

- A: for alphanumerical data,
- B: for binary data,
- CDF: for coded digital facsimile (code T4),
- D: for alphanumerical and/or binary data,
- F: for analog facsimile,
- NCDF:for non-coded digital facsimile
- R: for radar data

Note: The insertion of characters "/" and "+" between types of data shows that the types of data are exchanged on a time-sharing basis (/) or not (+).

(iii) Procedures:

- LAPB:for only operation of the physical and link level of X.25 procedures,
- X.25: for operation of the three levels of X.25 procedures (physical, link and packet levels),

- WMOH:for WMO error-control procedures based on the hardware system,
- WMOS:for WMO error-control procedures based on the software system.
- TCPS: for TCP/IP Socket
- TCPF: for TCP/IP FTP

(iv) Number of virtual circuits.

6. Remarks (only in English) are given in column (h)

Table A, p.1

STATUS OF IMPLEMENTATION OF GTS CIRCUITS AND PLANS/ETAT DE MISE EN OEUVRE DES CIRCUITS DU SMT ET PLANS

(a) Circuit	(b)	(c)	(d)	(e) Channel A/Canal A				(f) Channel B/Canal B				(g) Channel C	(h) Remarks/Remarques
Beijing Tokyo	A	Cab	64000	64000		X.25	3 PVC						Types of data: CDF+A+B
Cairo New Delhi	A	Sat	100		A								
Melbourne Tokyo	A	Cab	64000	64000		TCP/							CDF+A+B; 3 PVC (Socket),1 SVC (FTP),and 3 PVC Melbourne-Washington Frame relay network
Moscow New Delhi	A	Sat	4800 7200	2400 4800	NCDF NCDF			2400 2400	A A+B	X.25 X.25			
New Delhi Tokyo	A	Sat	9600 64000	4800	NCDF	X.25 TCP/	1 PVC 3 PVC	4800	A+B	X.25	2 PVC		Types of data: CDF+A+B
Offenbach Beijing	A	Sat	64000	64000		X.25	3 PVC						Types of data: CDF+A+B
Offenbach Jeddah	A	Sat	7200	2400	NCDF			4800	D	X.25	1 PVC		
Tokyo Washington	A	Sat	64000	64000		TCP/							CDF+A+B; 3 PVC (Socket),1 SVC (FTP) and 3 PVC Melbourne-Washington Frame relay network
Bangkok New Delhi	B	Sat	200		A								
Bangkok Tokyo	B	Cab	9600	9600	A+B A+B	X.25 TCP/	2 PVC						CIR:16 Kbits/s (Tok. to Ban.),8 Kbit/s (Ban. to Tok.); frame relay network
Beijing Khabarovsk	B	Sat	75		A								
Jeddah Bangkok	B	Sat	75		A A								Plan: 200 bauds or higher speed

STATUS OF IMPLEMENTATION OF GTS CIRCUITS AND PLANS/ETAT DE MISE EN OEUVRE DES CIRCUITS DU SMT ET PLANS

(a) Circuit	(b)	(c)	(d)	(e) Channel A/Canal A				(f) Channel B/Canal B				(g) Channel C/Canal C				(h) Remarks/Remarques
Jeddah New Delhi	B	Sat	200		A											
Jeddah Tehran	B		2400	2400		TCPS	1 PVC									
Khabarovsk Tokyo	B	Cab	9600	9600		X.25	3 PVC									Types of data: CDF+A+B
New Delhi Tehran	B	Sat	75		A											
Novosibirsk Khabarovsk	B	Cab	14400 28800	14400 28800		TCP/										Types of data: CDF+D+Email
Novosibirsk Tashkent	B	Cab	9600 28800	4800 28800	NCDF	TCP/		2400	A	X.25						Types of data: CDF+D+Email
Bahrain Doha	C	Cab	200		A											AFTN
Bahrain Kuwait	C	Sat Sat	100		A											AFTN Circuit dedicated to GTS traffic
Bangkok Hanoi	C	Sat	1200		A											
Bangkok Hong Kong	C	Sat	200		A											
Bangkok Phnom Penh	C	N/O														HF, 50 bauds (broadcast mode)
Bangkok Vientiane	C	N/O														HF, 50 bauds (broadcast mode)

STATUS OF IMPLEMENTATION OF GTS CIRCUITS AND PLANS/ETAT DE MISE EN OEUVRE DES CIRCUITS DU SMT ET PLANS

(a) Circuit	(b)	(c)	(d)	(e) Channel A/Canal A				(f) Channel B/Canal B				(g) Channel C/Canal C				(h) Remarks/Remarques
Bangkok Yangon	C	Sat	50		A											Request from Bangkok to upgrade the speed to 200 bauds
Beijing Hanoi	C	Sat	75 9600		A											
Beijing Hong Kong	C	Cab	9600	4800 9600	B D	TCPF		2400	A			2400	(1)			(1) Voice
Beijing Macao	C	Cab	9600	4800	CDF			2400	D							
Beijing Pyongyang	C	Cab	75 9600		A											
Beijing Seoul	C		9600 64000	4800	A	X.25	1 PVC	4800	NCDF							
Beijing UlaanBaatar	C	Sat	75 9600		A TCP/											
Doha Emirates	C	Cab	1200													
Hong Kong Macao	C	N/O														Telex, telefax
Jeddah Baghdad	C	N/O														
Jeddah Bahrain	C	Sat	1200	4800	D	X.25										
Jeddah Doha	C	Sat	1200	2400	A											

STATUS OF IMPLEMENTATION OF GTS CIRCUITS AND PLANS/ETAT DE MISE EN OEUVRE DES CIRCUITS DU SMT ET PLANS

(a) Circuit	(b)	(c)	(d)	(e) Channel A/Canal A				(f) Channel B/Canal B				(g) Channel C/Canal C				(h) Remarks/Remarques
Jeddah Kuwait	C	Cab	100	2400	A											
Jeddah Muscat (Seeb)	C	Sat	9600			X.25 TCP/										
Jeddah Sana'a	C	N/O Cab		100	A											AFTN
Khabarovsk Pyongyang	C	Cab	9600	4800	NCDF			2400	B	LAPB X.25						Operational difficulties experienced
New Delhi Colombo	C	Sat	50 75		A											
New Delhi Dhaka	C	Sat	2400		D	X.25										
New Delhi Kabul	C	N/O Sat		50	A											
New Delhi Karachi	C	Sat	50 9600		A D	 X.25										
New Delhi Kathmandu	C	Cab	50		A											
New Delhi Male/Hulule	C	Sat	75		A											
New Delhi Yangon	C	Sat	50		A											
Novosibirsk UlaanBaatar	C	Cab	9600 28800	4800 28800	NCDF	 TCP/	 2 PVC	2400	A	LAPB						 Types of data: CDF+A+B

STATUS OF IMPLEMENTATION OF GTS CIRCUITS AND PLANS/ETAT DE MISE EN OEUVRE DES CIRCUITS DU SMT ET PLANS

(a) Circuit	(b)	(c)	(d)	(e) Channel A/Canal A				(f) Channel B/Canal B				(g) Channel C/Canal C				(h) Remarks/Remarques
Tashkent Almaty	C	Cab	9600	9600		X.25	1 PVC									
Tashkent Ashgabad	C	Cab	100					FAX								Analog multiplexing
Tashkent Bishkek	C	Cab	75					FAX								Analog multiplexing
Tashkent Dushanbe	C	Cab	75													
Tashkent Kabul	C	HF	50	1200	A/F											AFTN
Tashkent Karachi	C	N/0														Operational difficulties experienced -
Tehran Baghdad	C	N/O Sat		100	A											
Tehran Kabul	C	N/O														
Tehran Karachi	C	Sat	50	100	A											
Tehran Sana'a	C	N/O Sat		100	A											Upgraded to 2400 bit/s in the future
Tokyo Hong Kong	C	Sat	200		A A+B	TCPS	2 PVC									CIR: 16 Kbits/s (both directions); frame relay network
Tokyo Seoul	C	Cab	64000	64000		X.25	3 PVC									Types of data: CDF+A+B

STATUS OF IMPLEMENTATION OF GTS CIRCUITS AND PLANS/ETAT DE MISE EN OEUVRE DES CIRCUITS DU SMT ET PLANS

(a) Circuit	(b)	(c)	(d)	(e) Channel A/Canal A			(f) Channel B/Canal B			(g) Channel C/Canal C			(h) Remarks/Remarques
Algiers	D	Sat	50		A								
Jeddah				4800									
Bangkok	D	Cab	1200		A								
Kuala Lumpur													
Cairo	D	Sat	100		A								
Jeddah													
Manila	D	Sat	200		A								
Tokyo													
Melbourne	D	Sat	N/O		A								
New Delhi													Plan to use Internet
Moscow	D	Sat	7200	4800	NCDF		2400	D	X.25				
Beijing													
Moscow	D	Sat	100		A								
Hanoi													
Moscow	D	Cab	28800	28800	NCDF	TCPS							Types of data: CDF+D+Email
Kabharovsk			64000	64000		TCPF							
Moscow	D	Cab	28800	28800	NCDF	TCPS							Types of data: CDF+D+Email
Novosibirsk			64000	64000		TCPF							
Moscow	D	Cab	7200	4800	NCDF		2400	A	X.25				
Tashkent			28800	28800									CDF+D+Email
Moscow	D	Cab	N/O										
Tehran			9600		TCPS								
Bangkok	X												
Beijing			9600			X.25							Upgrades under testing

STATUS OF IMPLEMENTATION OF GTS CIRCUITS AND PLANS/ETAT DE MISE EN OEUVRE DES CIRCUITS DU SMT ET PLANS

(a) Circuit	(b)	(c)	(d)	(e) Channel A/Canal A			(f) Channel B/Canal B			(g) Channel C/Canal C			(h) Remarks/Remarques
Bangkok Singapore	X	Sat	2400			X.25							
Moscow Almaty	D	Cab	19200	19200		TCP/							Types of data: CDF+D+Email

Annex V

Coverage of the Region II by satellite distribution systems

The coverage of Region II by satellite distribution systems is given in the following Table:

Complete or near-complete coverage by	Partial coverage by
UKSF/WWW **	ISCS (primarily ISCS (Pacific)) MDD MTSAT (planned for March 2000) TV-Inform-meteo Systems operated by China *, India and Thailand

* Component of the RMTN
** Pilot project

The approximate footprints of the satellite distribution systems with large beams (except for the WEFAX) are given in figure 2. The approximate footprints of the satellite distribution systems with spot beams are given in figure 3.

Annex VI

TABLE 1 - STATUS OF RSMCs AND NMCs RELATIVE TO NUMERICAL MODELS

(1997 or 1998 information)

REGION II

						DISSEMINATION			
CENTRE	***STATUS***	***MODELS***	***RESOL.***	***LEVELS***	***RANGE***	***GTS***	***FAX***	***SATELLITE***	***SPECIAL***
BANGKOK	NMC	LAM							
HANOI	NMC	LAM							
HONG KONG	NMC	LAM-(OLAM)	1°	13	72 h				
		LAM (RSM)	60 km	20	48 h				
PYONGYANG	NMC	LAM							
SEOUL	NMC	GM (GDAPS)	T106	L21	240 h				
		MSM (RDAPS)	30 km	33	48 h				
		Typhoon (GFDK)	20 km	18	60 h				
		Ens 12 members	T106	L21	30 days				
TEHRAN	NMC	LAM							
ULAANBATAR	NMC	LAM							
NCMRWF -INDIA	Special Centre	GM	T63	L16					
BEIJING	Geo. and Transport Model (T.M.) RSMC	GM	T106	L19	10 days	GTS	Fax	SAT	
		LAM-(HLAFS)	0.5°	20	48 h				
		LAM-(MTTP). Tropical	50 km	15	48h				
		Ens. 12 members	T63	L16	12 days				
JEDDAH	Geo. RSMC						Fax		
KHABAROVSK	Geo. RSMC	LAM	100 km	11	48 h		Fax		
NOVOSIBIRSK	Geo. RSMC	LAM	40 km	15	48 h		Fax		
TASHKENT	Geo. RSMC	LAM	250 km	10	36 h		Fax		

NEW DELHI	Geo. and T.C. RSMC	full access to GM (NCMRWF)	T63	L16		GTS	Fax		
		LAM (LAFS)	1°	12	48 h				
		LAM (nested)	0.5°	16	48 h				
TOKYO	Geo.- T.M. and T.C. RSMC	GM (GSM9603)	T213	30	192 h	GTS	Fax		special
		Ens. 10 members	T63	30	One month				
		MSM (RSM9603)	20 km	36	51 h				
		Typhoon (TYM)	40 km	15	78 h				

TABLE 2 COMPUTERS USED FOR DATA PROCESSING AT RSMCs AND NMCs

(1997 or 1998 information)

REGION II

CENTRE	*MAINFRAME (number cruncher)*	*SECONDARY COMPUTER(S)*	**WORK STATIONS**
ALMATY			PCs
BANGKOK		DATA GEN. MV7800 - 2 HP9000	
HANOI		MINCOMP ROBOTRON	MICRO PS
HONG KONG	CRAY SV-1	3 IBM RS/6000 590, SGI Origin 2000, 2 SUN E450, 2 SGI O2	WSs
KARACHI			PCs
PYONGYANG		EC-1055M - IBM370/148	PC/AT – PS/2
SEOUL	NEC SX-5/16A	FUJITSU VPX 220	SUN 2000
TEHRAN			PCs 486
ULAANBATAR			MICRO VAX 3400
NCMRWF-INDIA	CRAY XMP-14	2 VAX 8810 - VAX 8250	
BEIJING	CRAY C92/1-128, Dawning 1000A	CRAY J90 - CRAY EL 98/4 – IBM SP2/32 – 2 ALPHA 1000 – 2 ALPHA 4000	WSs
JEDDAH		CDC CYBER 962 – 2 CDC 910	3 SG – 4 VAX – 3 CDC
KHABAROVSK		COMPAREX 8/830	PCs
NOVOSIBIRSK		COMPAREX 8/830	PCs
TASHKENT		IBM 370 (2 4381 P13)	PCs
NEW DELHI	CDC CYBER 2000U	CDC 4680	CYBER 910-484 WSs - VAX 3400 - 2 VAX 11/750
TOKYO	HITACHI 3800/480	HITACHI 3500	HITACHI 3050RX WS s

Annex VI

Table 3 Providers of products that RA-II countries receive

Country	Provider of products
United Arab Emirates	Bracknell, ECMWF
Bahrain	ECMWF, Toulouse, Bracknell
China	NCEP, ECMWF, JMA
Hong Kong, China	ECMWF, JMA
Iran	Bracknell
Japan	Melbourne, Washington (Kansas City), ECMWF, New Delhi, Wellington, London, Moscow, Montreal
Kazakstan	ECMWF, Washington
Korea	JMA, Washington, New Delhi, Melbourne, Wellington
Kyrgyz	WMC
Maldives	ECMWF, Bracknell
Macao, China	ECMWF, JMA
Russia, Khabarovsk	Washington, Moscow
Russia, Novosibirsk	Washington, Moscow
Saudi Arabia	Washington
Sri Lanka	ECMWF
Thailand	No information
Uzbekistan	Washington, ECMWF
Yemen	EZRR, ECMWF, EDZW, LFPW

Annex VI

Table 4 Output Products required from other GDPS centres

	Producer	Product species	Time of ref(UTC)	Parameters (Element & level)	Range (forecast hours)	Area	Used for	Method of transmission	Code form
	(1)	(2)		(3)			(4)	(5)	(6)
Hong Kong, China	ECMWF ECMWF ECMWF	F F F	12 12 12	(U,V)*(850,200) RH*(850,700) Psea, (Z,U,V,T,TTD)* (surface,850,700,500,200)	96,120,144 (00,24,....,144) (00,24,....144)	ASIA ASIA ASIA	R R R	IC IC PP	GRID GRID GRIB
Iran	Washington	F	00,12	D,Z,T,U,V	12,24,36,48,72, 96,120 hrs	07004 00--90E 20N--90N	R, AV EH, MR, AG	RF	GRID
Kazakstan	Tokyo		00,12	Psea, T850, U,V850, H500	00,24,48,72,96	Northern Hemisphere	forecast	IC, PP	GRID
Maldives	Tokyo Washington	A & F A & F	00,12 00,12	(Z,U,V,T,TTD)*(850,700,500,300) (Psea,Z,T)*(850,500)	00,24,48,72 00,24,48,72	Asia Asia	R R, MR	IC IC	GRID GRID
Saudi Arabia	Washington ECMWF	A & F A & F	00,12 00,12	TTD*(850,700,500) PVA500, $_w$*(1000,850) Z500, T500, VOR500	00,24,48 00-168	Europe & Western Asia Global	R R	IC IC	GRIB GRIB
Sri Lanka	Washington KWBC	F	00,12	(Z,U,V,T,TTD,OMG) (850 - 100)	24,48	Global	R, AV	PP	GRID GRIB
Uzbekistan	Washington and /or Reading, UK	A	near to 00,12	TOVS data	00	Region RA	R	ST	SATEM
Yemen	Tokyo	A & F	00,12	(Z,U,V,T,TTD)*(surface, 850,700,500,400,300)	12,24	Asia	R, AV	ST	GRID

(1) Center at which product is produced
(2) A=Analysis, F=Forecast, Others
(3) Meteorological Elements such as Psea, Z=geopotential height, T=Temperature, U,V=Wind components, TTD=(T-Td), VOR=Vorticity, OMG=Vertical wind velocity, Others and pressure levels (for example Z500, T850, OMG700 etc. or (Z,U,V,T,TTD) *(850,700,500,300))
(4) R=Routine weather forecast, TC=Tropical cyclone, EH=Environmental hazards, VR=Verification, MR=Marine, AV=Aviation, HD=Hydrology, AG=Agrometeorology, BN=Boundary values of limited area models, Others
(5) IC=International circuit on lease(GTS), PP=point to point communication excluding GTS, RF=Radio Fax, ST=satellite communication, Others
(6) A/N, GRID, GRIB, FAX, Others

Annex VII

1. Analysis of the Strengths, Weaknesses, Opportunities and Threats (SWOT) with respect to the current RMTN

Strengths	**Opportunities**
• There is an appropriate geographical distribution of 9 RTHs. • Funding is understood.	• Some of satellite broadcast services are available in Region II. • Areas for Internet availability are expanding. • Increasing competition and range of services among suppliers leads to falling prices of international telecommunications. Furthermore, more cost-effective network services are emerging in several areas. • Increase of standardisation level and availability of open technology facilitate RMTN implementation and operation.
Weaknesses	**Threats**
• Implementation is incomplete and there are still lots of low speed circuits without error correction. As the result, parts of essential data are not inserted into the RMTN. • The RMTN does not meet the distribution requirements in the required time and exchange in binary form, due to the lack of necessary speed and protocols. • Support and maintenance of the legacy protocols and HF broadcast functions are a burden to RTHs. • There is no overall arrangement for appropriate and back-up routing. As the result, Members differ as to their data availability and stability. • There is a lack of flexibility in responding to changing requirements and technical developments.	• Failure to keep pace with technology and to address new requirements could lead users to migrate to other networks outside WMO structure, redirect their investment and so undermine the GTS. • Some centres fail to catch up or keep up with the modernisation of the RMTN and so weaken the overall RMTN capabilities. • International telecommunication carriers may discontinue their low speed circuit services. Some connectivities may disappear from the RMTN.

2. Requirements on an improved RMTN

(a) Collection and dissemination of observational data shall be made within the Region and with adjacent Regions. Observational data distribution shall be made from all NMCs (RTHs) within no more than 15 minutes.

(b) Processed information to be distributed within the Region should be delivered to each NMC (RTH) concerned within the agreed time.

(c) Each NMC (RTH) should have the capability to receive the whole set of data available in the RMTN; the minimum rate of transmission should be 2400 bits/s ; the TCP/IP protocol should be used on the RMTN circuits.

(d) The RMTN should also meet other requirements of the Members on real-time and special data exchange, including requirements of the WMO programmes other than the WWW programmes (transmission of some data can be realised on a non-real-time basis). That exchange of these data should not hamper the exchange of the basic WWW data and products.

(e) The RMTN should provide transmission of both alphanumeric and binary data of various volumes and types of information (bulletins, charts, files); as examples, the formats of presentation could use GRIB, T4 and BUFR codes.

(f) The RMTN should provide accuracy (without errors) and reliability of transmission (back-up routes, retransmissions).

(g) Information should be represented in the appropriate standardised form, acceptable to the recipient.

(h) The RMTN should have the appropriate interfaces with the MTN and comply with the appropriate standards of the CBS.

(I) The RMTN should be flexible in respect of the increase of its efficiency as well as the expansion of functions.

(j) The RMTN equipment should be reliable so as to provide round-the-clock operation and have adequate maintenance support during the operational life.

(k) The RMTN should be implemented and operated in a cost-effective manner. Each Member, when being connected to the RMTN, shall have a choice from a set of functions depending on its financial and technical potentials.

(l) The RMTN should make the most use of "open" standard protocols and techniques of data transmission (for example, OSI and INTERNET protocols).

(m) The RMTN should be flexible in several ways. For instance, it should be possible to accommodate changing requirements for the regional exchange. It should be possible for one or more Members who agree on bi/multi-lateral data exchange to be served by the RMTN, on the understanding that additional costs arising are borne by the Members concerned and the exchange of those additional data should not hamper the exchange of the basic WWW data and products.

(n) Management of the network should be significantly improved; Internet or equivalent network should be used to exchange information on the operational status of centres and circuits, including possible arrangements for alternative routes and notification of circuit resumption (with a view to ensuring that the flow of data remains unaffected).

(o) Security of the RMTN should be provided (protection from unauthorised access, incorrect use, destruction).

(p) The evolution from the existing status of the RMTN should be achieved without disruption and with at least the same level of service as it is achieved by the existing system. Members concerned should be able to choose for themselves the “intercept point” at which they become full participants in the improved RMTN.

Annex VIII

Design of the transport network of an improved RMTN

1. The expert team on the improved Main Telecommunication Network (Geneva, September-October 1999) and the implementation co-ordination meeting on the MTN (Geneva, October 1999) agreed to recommend an improved MTN based on the following approach: the MTN would be implemented through network services from a small number of providers ("clouds"). Some MTN centres would provide gateway functions between the "clouds". A first implementation phase (phase 2A) would mix "clouds" and point-to-point circuits. A second phase (phase 2B) would provide the full MTN connectivity through the "clouds".

> Note: a "cloud" is defined as follows: three or more centres use a common provider of network services with a contractual framework to implement the required connectivity among the centres concerned.

2. These meetings agreed to encourage the establishment of lead groups of MTN centres, sharing a common interest and requirement for MTN (and possibly other) connectivity among them. The meetings suggested five groups. Group D includes the MTN centres located in Region II (Beijing, Jeddah, New Delhi and Tokyo), and Moscow and Offenbach.

3. The proposed network D of the improved MTN into the improved RMTN could be designed to satisfy the requirements of the improved RMTN in terms of exchange of data between those MTN centres. The network D would be the core network of the improved RMTN. The four MTN centres would be the gateways between the core network and the others parts of the improved RMTN.

4. The other parts of the improved RMTN would be organised in networks based on geographical consideration. Each network would be operated and managed by each of the possible following groups:

(a) Eastern part – Beijing, Tokyo and Bangkok being the leading centres;
(b) Southern part – New Delhi being the leading centre;
(c) Middle east part – Jeddah and Tehran being the leading centres;
(d) Northern part – Tashkent, Novosibirsk and Khabarovsk (plus Moscow) being leading centres.

An example of implementation of the improved RMTN is given in the Figure A.

5. Each network should be established using modern cost-effective network services such as Frame Relay network services and/or Managed Data-Communication Network services. The improved RMTN should use TCP/IP only. The improved RMTN would be supplemented by the Internet, with suitable separation of traffic and security measures. Some RTHs should provide backup source servers. Some RTHs should provide test environment for centres migrating to TCP/IP base. VPN (Virtual Private Network) technique should be used when an Internet connection is established for a substitute for a low speed circuit.

6. Satellite broadcast services can form part of a network and can be used for the transmission of essential data or as a backup source.

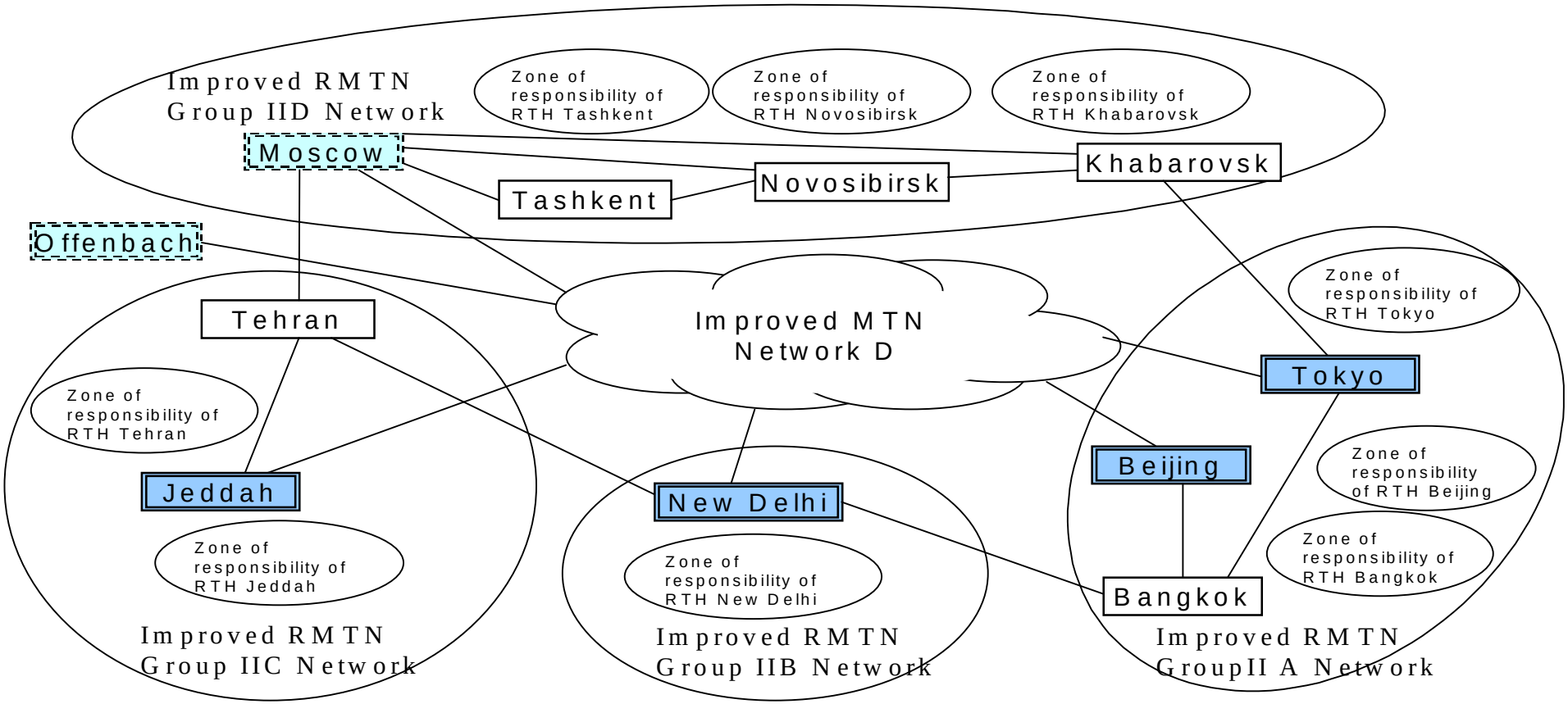

Figure A

Example of possible implementation of the improved RMTN

Annex IX

Schematic table of replies received from Members as at January 25, 2000

Member	no conditions	generic conditions	Additional data	additional products	new data	new products
Region I						
Kenya			X		X	
South Africa	X					
Region II						
Iran			X			
Japan	X					
Kazakhstan			X		X	
Uzbekistan		X	X	X	X	
Region III						
Argentina	X					
Guyana	X					
Venezuela			X			
Region IV						
Netherlands Antilles						
USA	X					
Region V						
French Polynesia		X	X			
Malaysia (*)		X	X			
New Caledonia		X	X			
New Zealand	X					
Region VI						
Austria		X	X			
Czech Republic		X	X		X	
Croatia (*)		X	X			

Denmark		X	X			
Finland		X	X			
France		X	X	X	X	X
Germany		X	X	X		X
Greece		X	X			
Hungary		X	X			X
Iceland		X	X			
Ireland		X	X		X	
Israel		X	X			
Italy		X	X			
Latvia		X	X			
Luxembourg		X	X	X		
Netherlands		X	X			
Norway		X	X			
Portugal		X	X		X	
Slovakia		X	X			
Slovenia			X			
Spain		X	X			
Sweden		X	X			
Switzerland		X	X			
Syria						
United Kingdom		X	X	X		X
ECMWF		X		X		
EUMETSAT						X

Explanations:

no conditions := The Member stated that it has no intent to place conditions on its data and products in case or re-export and will, therefore, not identify "additional" data or products;

generic conditions := The Member identified "additional" data and/or products and attached generically worded conditions to their re-export; the text of these generic conditions was distributed to all Members in the WMO circular letters;

additional data := The Member identified "additional" data in the sense of Res. 40 (Cg-XII);

additional products := The Member identified "additional" products in the sense of Res. 40 (Cg-XII);

Annex X

Year 2000 Awareness and Preparedness of WMO Members in RA II
Last updated21 October 1999

Country	Status unknown	**C**ompliant	**P**roject underway	Aware of problem but **N**o Project underway	**M**SS compliant, working on other systems	**A**dvice or assistance requested
Totals	**10**	**9**	**11**	**3**	**2**	**4**
Afghanistan	**X**					
Bahrain		C				
Bangladesh			P			A
Cambodia	**X**					
China[1]		C				
Dem. People's Rep. of Korea	**X**					
Hong Kong, China		C				
India			P			
Iran, Islamic Republic of			P			
Iraq	**X**					
Japan		C				
Kazakstan			P			
Kuwait	**X**					
Kyrgyz Republic		C				
Lao PDR				N		A
Macao			P			
Maldives	**X**					
Mongolia			P			A
Myanmar				N		
Nepal	**X**					
Oman		C				
Pakistan			P			A
Qatar			P			
Republic of Korea			P			
Russian Federation			P			
Saudi Arabia					M	
Sri Lanka			P			
Tajikstan	**X**					
Thailand					M	
Turkmenistan	**X**					
United Arab Emirates		C				
Uzbekistan		C				
Vietnam		C				
Yemen	**X**					

1. Members in **bold** type operate RTHs