WORLD METEOROLOGICAL ORGANIZATION

REGIONAL ASSOCIATION III

(SOUTH AMERICA)

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

Third session

FINAL REPORT

Buenos Aires, 23 - 27 APRIL 2001

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LIST OF PARTICIPANTS

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GENERAL SUMMARY OF THE WORK OF THE SESSION

1. OPENING OF THE SESSION

1.1 At the kind invitation of the Government of Argentina, the third session of the Working Group on Planning and Implementation of the WWW in Region III was held from 23 to 27 April 2001 at the premises of the Servicio Meteorológico Nacional. The session was opened by the chairman of the working group and Permanent Representative of Argentina with WMO, Mr Miguel A. Rabiolo (Argentina).

1.2 Commodore Ricardo A. Grünert, Director-General of the Argentinean Meteorological Service expressed great satisfaction that the meeting was being held in Argentina and welcomed and wished all participants a pleasant stay in Buenos Aires. Commodore Grünert emphasised the importance of this session of the Working Group, indicating that its success would be translated to benefits to all technical programmes of WMO, leading to the modernisation of the WWW components in RA III.

1.3 Mr D. C. Schiessl, Director, World Weather Watch - Basic Systems Department, welcomed the participants and conveyed the best wishes of the Prof. G.O.P. Obasi, the Secretary-General of WMO for a successful meeting. Mr Schiessl thanked the Government of Argentina, and in particular the National Meteorological Service, for hosting and supporting the meeting of this important Working Group of the RA III. He thanked the chairman of the Group and the Rapporteurs on the Regional Aspects of the GOS, GTS, GDPS, Data Management and Codes, and of the PWS, for their work during the intersessional period and for preparing this meeting. Mr Schiessl emphasised that the outcomes of this Working Group are anticipated with great interest by the entire Region and will be submitted to the forthcoming session of the RA III to be held in September of this year. He explained that among the many tasks given to this Group by XII-RA III, the most important one was the review of Regional Meteorological Telecommunication Network (RMTN) and the consolidation of the strategic plan of the new RMTN with a view to progressing towards its implementation as soon as possible.

1.4 There were 14 participants from 8 Members of RA III. The list of participants is given at the beginning of the report.

2. ORGANIZATION OF THE SESSION

2.1 Adoption of the agenda

2.1.1 The provisional agenda was adopted by the session and is reproduced at the beginning of the report.

2.2 Working arrangements

2.2.2 Pre-session and in-session documentation was available in English and Spanish, and simultaneous interpretation into English and Spanish was provided during the meeting. The session agreed on its working hours.

2.2.3 The session discussed and welcome the current practice of distribution of meeting documents through the WMO web server as well as by e-mail. This had allowed many participants to download the documents well in advance and significantly decreased the necessity of reproduction of documents. In addition, this procedure make documents available in electronic format facilitating its further use by NMHSs. Because this is a rather new practice the session suggested that the Secretariat should include the URL of the web pages containing documentation of upcoming meetings when sending the invitation letters to such meetings.

3. REPORT OF THE CHAIRMAN OF THE WORKING GROUP

3.1 Activities since the second session

3.1.1 The session thanked its chairman, Mr. M. Rabiolo (Argentina) for the comprehensive report, which reviewed the activities of the working group since its re-establishment by XII-RA III. In his presentation Mr. Rabiolo pointed out the achievements of the Region as well as the existing shortcomings in the components of the WWW in the Region. He stressed the difficulties he encountered to carry out his work by correspondence, but also stressed the importance of a concerted effort in the Region for further development of the WWW components that can only be achieved through effective cooperation. In this connection the meeting identified an increased effectiveness of the work of the regional rapporteurs as one of the key issues, and discussed several options for achieving this. The meeting felt that the best approach would be the implementation of a scheme of incentives similar to those already in use by the WMO Technical Commissions. It recommended, therefore, the Regional Association to adopt an award scheme with a view to recognising outstanding services rendered by some chairpersons, rapporteurs, etc., by presentation of a certificate to the individual to be honored at the session the Regional Association. In addition, national focal points should be designated for each WWW area. This would facilitate the communication with the rapporteurs. The session considered that the designation of focal points was of crutial importance, even indispensable, to the work of the rapporteurs. Finally, the meeting recommended the use of greater flexibility in cases when a rapporteur or chairperson is or becomes unable to carry out the duties entrusted to him/her.

3.1.2 Particular items of the report of the chairman of the working group were considered under the relevant agenda items.

3.2 Meetings of Directors of RA III NMHSs

3.2.1 The first session of the Working Group on Internal Matters of RA III was held in Santiago, Chile, from 2-4 November 2000 under the chairmanship of Mr. Nelson Salazar (Ecuador), chairman of the Working Group and president of RA III. The session reviewed several issues concerning the planning and implementation of the WWW in the Region, including the redesign of the RBSN, the advances in the production and use of Numerical Weather Prediction products, the delivery of services to the public and the exchange of data and products. The project of the new Regional Meteorological Telecommunication Network (RA III RMDCN) was extensively discussed. The final report of the session in both Spanish and English had been previously distributed to all RA III Members. The suggestions and recommendations of the Working Group were considered under the relevant agenda items.

3.2.2 In particular, the session was pleased with the agreement reached in Santiago concerning the designation of experts to serve as rapporteurs in their areas of expertise.

4. CONSIDERATION OF THE DECISIONS RELATED TO WWW OF XII-RA III, Cg-XIII, EC-LII AND CBS-XII INCLUDING REQUIREMENTS FOR WWW SUPPORT TO OTHER PROGRAMMES

4.1.1 The session was informed about the decisions related to WWW of XII-RA III, Cg-XIII, EC-LII and CBS-XII. Attention was drawn to the decisions and recommendations relating to the implementation of the WWW in the Region. The working group noted that 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. In particular, it noted that the thirteenth Congress stressed the importance of the links between CBS and Regional Associations with respect to co-ordinated implementation of the WWW and urged them to strengthen their collaboration.

4.1.2 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). Members of OPAGs were expected to work and receive information by correspondence. The group was also informed that the tasks 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/Co-ordination Teams (ICTs) that are mainly based on regional representation to focus on co-ordinating operational implementation aspects. The session was pleased to note that regional representation in ICTs was successfully made through the nomination of Co-ordinators and Rapporteurs as ex-officio members of ICTs of the relevant OPAGs.

4.1.3 The working group was informed about the concerns expressed by Congress regarding the low availability of upper air data from some WMO regions due to economic constraints experienced by developing and countries in economies in transition. In spite of significant progress GTS has achieved, serious shortcomings still existed in some Regions. Concerning the GDPS, Congress invited donor Members to enhance their participation in the upgrading and sustaining the data processing and forecasting facilities in developing countries. Congress supported further development and implementation of the DDBs and strongly urged Members to consider hosting or providing resources to a software support centre for encoding/decoding software for BUFR, CREX, and GRIB.

4.1.4 The session noted that the Executive Council had stressed the importance of ensuring effective participation of developing countries in the planning and decision process regarding the WWW Basic Systems. The session recognised that the new structure of the CBS is expected to facilitate this participation.

4.1.5 The session was informed about other issues considered by CBS, including the development of objective criteria to assist in the selection of stations to be included in the RBSN, the project for the Improved Main Telecommunication Network, the proposal for the future WMO Information System and new development and requirements of Ensemble Prediction System (EPS) products.

5. WWW COMPONENTS AND SUPPORT FUNCTIONS, INCLUDING REPORTS OF THE RAPPORTEURS

5.0 Status of WWW implementation and operation

Results of the 2000 Annual Global Monitoring of the operation of the WWW in RA III

5.0.1 The session reviewed the status of implementation and operation of the WWW in RA III. The Secretariat received results of the 2000 annual global monitoring from 6 RA III Members. Four Members provided monitoring results on electronic media (diskettes or Internet). The session encouraged the participation of centres located in Region III in the exchange of monitoring results on electronic media. It urged all NMCs to make every effort to participate in the monitoring exercises, at least by monitoring their national observational data.

5.0.2 The session noted with appreciation the analysis of the monitoring results prepared by the Secretariat which included various bar diagrams, maps and tables providing a general comparison between Regions and with previous years, as well as a detailed regional analysis of the availability of SYNOP, TEMP, CLIMAT and CLIMAT TEMP reports at NMCs and at the WMC/RTH, including their geographical distribution in the region. The meeting reviewed the analysis of the results of the 2000

annual global monitoring of the operation of the WWW. Table A is a condensed summary of these results.

Table A

Type of data	Reports received from 1 to 15 October 2000 at MTN centres	Reports expected to be prepared*
SYNOP	64%	76%
Part A of TEMP	40%	51%
CLIMAT	39%	71%
CLIMAT TEMP	45%	75%

Note: the percentages are calculated with the RBSN as the reference

* At stations implemented according to WMO-No. 9, Vol. A (July 2000).

5.0.3 The meeting noted that the availability of reports was not homogeneous within the Region and that there are areas from where the availability of reports was not satisfactory:

- No SYNOP reports were received from Ecuador. Less than 30 per cent of the expected reports were received from Guyana and Suriname.

- No TEMP reports were received from Bolivia, Ecuador, Guyana, Paraguay and Venezuela. Less than 31 per cent of the expected reports were received from Colombia and Peru.

5.0.4 The session noted that there was an increase in the availability of SYNOP reports (from 48 to 64 per cent) and TEMP reports (from 21 to 40 per cent) from RBSN stations during that period, together with an increase in the number of RBSN stations in 1998. As regards the timeliness of the reception on the MTN, 61, 63 and 64 per cent of the required SYNOP reports were available on the MTN within one hour, two and six hours, respectively, after the time of observation; 29 and 40 per cent of the required TEMP reports were available on the MTN within two and twelve hours, respectively, after the time of observation.

5.0.5 The availability of SYNOP reports was only 26 per cent for 06 UTC compared to more than 70 per cent for the other hours of observation. The availability of TEMP reports was only 16 per cent for 00 UTC compared to 63 per cent for 12 UTC.

5.0.6 The lists of silent stations include 49 SYNOP stations and 17 TEMP stations from which reports were not received by any WWW centre during the monitoring period from 1-15 October 2000.

5.0.7 The session identified some discrepancies on the monitoring results, apparently due to the failure of Members to inform the Secretariat of the changes occurred in the observation network. In this respect the session requested all participants to report to the respective NMHSs the importance of keeping Volume A constantly updated to avoid such discrepancies.

5.1 **Global Observing System (GOS)**

Report of the Rapporteur

5.1.1 The session thanked Mr. Luis Farias Briceño (Chile) for his activities as regional rapporteur on the GOS. Particular items of his report were considered under the relevant agenda items.

Regional Basic Synoptic Network

5.1.2 The session noted that the current RA III RBSN comprises 467 surface stations and 56 upper-air stations. According to the results of the annual global monitoring of the operation of the WWW (October 2000), the level of implementation of surface observations in the RBSN of RA III comprised 76% as in 1999, while the number of reports actually received at MTN centres in October 2000 increased to 64% of expected reports as compared with 59% in 1999. Regarding upper-air observations, the level of implementation was also unchanged as compared with 1999 and constituted 51%. The number of upper-air reports actually received at MTN centres has increased from 35% in 1999 to 40% in 2000. The major reason for this improvement was prompt coordinated action taken by the Members concerned, the Secretariat and donor countries mostly related to the replacement of obsolete equipment and support in provision of consumables and spare parts to certain countries.

5.1.3 The session discussed the best way to assist the next session of RA III (Quito, September 2001) with the selection of stations to comprise the future RBSN to be proposed by the Regional Association. It noted that the Rapporteur on Regional Aspects of the Global Observing System had already prepared a list of 507 stations which were selected taking into account the criteria established by XII-RA III (Salvador, 1997). This list, which is included in the annex to this paragraph, should constitute the basis for the Draft Recommendation to be submitted to XIII-RA III. The session was informed about the development of new criteria for inclusion of stations in the RSBNs, based on the spatial resolution, requirements and performance results of the stations. The session felt that the use of the new criteria would not introduce significant difficulties. It agreed, however, that the working document with the Draft Resolution proposing the new RBSN should contain detailed explanation of the followed approach.

Other networks, including sea stations

5.1.4 The session was informed that the total number of ships recruited by Members of the Association has increased from around 350 in 1997 to around 430 in 2000, most of them under the Brazilian flag, and one being equipped to make upper air soundings. This represents about 6% of the global total, from which around 5000 reports daily are distributed on the GTS. There remains, however, large areas in the Southern Hemisphere, especially in the South Pacific, and to lesser extent in the South Atlantic, away from coastal areas, where ship reports are very sparse.

5.1.5 While ship reports reasonably adequately cover the major shipping lanes, moored and drifting buoys play an increasingly important role in providing basic observations from the remaining large, data void, ocean areas. The International South Atlantic Buoy Programme (ISABP), an action group of the DBCP, has, since its formation in 1995, succeeded in substantially increasing the deployment of drifting buoys in the South Atlantic and hence the availability of data from these platforms on the GTS. Participants in the ISABP include, inter alia, Argentina and Brazil. At the same time, the PIRATA project has deployed a network of moored buoys in the equatorial Atlantic, which are providing meteorological and oceanographic data in support of global climate studies and operational meteorology. Participants in PIRATA include Brazil, France and the USA. During the past ten years, the number of reports from global and regional drifting and moored buoy programmes distributed on the GTS has increased from approximately 40,000 per month to 270,000 per month. The coverage is now reasonable in RA III waters especially the South Atlantic south of 30S. In February 2001, within RA III, Argentina was operating one drifting buoy and Brazil ten.

5.1.6 Although the implementation of automatic meteorological data observing and reporting systems aboard aircraft began 15 years ago, the first systems were not introduced in RA III until Argentina installed 2 ASDAR units on its national airline in December 1997 and March 1999 respectively. The WMO ASDAR Programme reached a peak in early 1999 with 21 operational systems. However, there has been a substantial reduction in the programme since then with 10 systems already withdrawn from BA aircraft in the past 2 years. Other airlines are also considering the removal of ASDAR units in 2001 as they decommission old aircraft. Although the ASDAR

system is in decline, there are several units including those being operated by Argentina, that are considered to have a high priority and should be kept operating until at least the end of 2002. These units still provide valuable upper air data in relatively data sparse areas.

5.1.7 The ASDAR system is being increasingly replaced by the very cost effective Aircraft Meteorological data Relay (AMDAR) system which requires only software to be loaded on appropriately equipped aircraft and a receiving centre for injection on the GTS. Globally about 1000 aircraft from 10 participating countries are providing more than 100,000 observations daily for distribution on the GTS. A number of flights from visiting aircraft from Australia, the US and Europe operating in Region III now provide timely, accurate and cost effective profiles of temperature and wind at several major airports as well as over-flight data. The data transmission costs are paid for by the airlines' host country, distributed on the GTS and available for use by interested national Meteorological Centres in the Region. More observations could be obtained from additional visiting aircraft if a way could be found to pay for the modest transmission costs for the data from these aircraft.

5.1.8 The session welcomed the announcement from Chile concerning its intention to establish a national and eventually, a regional AMDAR program using its national carrier. It is anticipated it will take several years before the system becomes fully operational. It is understood that Brazil also has aircraft appropriately equipped to collect AMDAR data but it was not clear whether such data were being received by any meteorological service. The session requested the Secretariat to prepare an information document about the AMDAR system to be distributed during the AR III session with a view to facilitate further dialogue with respective arlines.

CLIMAT and CLIMAT TEMP reporting stations

5.1.9 As compared with assessments made during the previous session of the working group, the availability of CLIMAT and CLIMAT TEMP reports originating in the Region continued to be disappointing. Despite appeals by the Association for many more of the synoptic stations to prepare such reports, the number of reports received remained less than half of the expected. Only 184 (39%) CLIMAT reports received out of 467 reports expected from the Regional Basic Synoptic Network stations for CLIMAT and 25 (45%) CLIMAT TEMP reports received out of 56 reports expected from the Regional Basic Synoptic Network stations for CLIMAT TEMP in the Region. Out of the 467 stations, which are indicated in Volume A as producing CLIMAT reports only 332 (71%) were received in the monitoring period. Similarly, the number of CLIMAT TEMP reports received during the monitoring period was 43, constituting 77% out of 56 stations indicated in Volume A as preparing such reports.

PAC-SONET

5.1.10 The session was informed about a the PAC-SONET project, which is underway in Region III and IV. It is a research project co-ordinated and funded by NOAA planned to collect PILOT data during the period of about three years to support studies of precipitation climatology in the western coast of Central and South America. The data is being transmitted via Internet and, although it is planned, is not yet distributed on the GTS. The session felt the considerable amount of data being collected would certainly be very useful for RA III NMHSs and requested that the three RTHs of the Region request RTH Washington to include the mentioned data in their respective switching directories. The RTHs would then forward the received data to the associated NMCs.

Space-based sub-system

5.1.11 A status report of the space-based sub-system of the GOS, which were prepared by the respective satellite operators was presented to the session. Relevant information is provided in the annex to this paragraph.

5.2 **Global Telecommunication System (GTS)**

Report of the Rapporteur

5.2.1 The session noted with appreciation the report of the Rapporteur on Regional Aspects of the GTS in RA III, Mr. Jose Mauro de Rezende (Brazil). Particular items of his report were considered under the relevant agenda items.

Status of Implementation of the GTS in RA III

5.2.2 The meeting discussed exhaustively the status of implementation of the GTS in Region III and noted that in spite of the progress reached specially by RTHs Brasilia and Buenos Aires, old shortcomings persist. The lack of computer capability and the low speed of telecommunication circuits are precluding the NMCs from accessing the significant amount of data and products available at the RTHs of the Region. The diagram showing the GTS plan and its implementation for RA III is included in the annex to this paragraph.

5.2.3 The session noted that significant improvement has been achieved with the implementation of the 64 kilobit/sec digital point-to-point circuits between RTHs Brasilia and Buenos Aires and RTH Washington. Some telecommunication functions of some RA III NMCs were upgraded thanks to the donation of equipment and software, and technical visits of experts seconded by Members. However, in spite of the indicated progress, serious shortcomings still exist, apparently due to budget constraints in some countries rather than due to the unavailability of adequate telecommunication services in the Region.

5.2.4 The session was informed by the participant from Venezuela about the project being implemented, which aims to modernise several areas of the Meteorological Service, including RTH Maracay and its associated national and international circuits. He offered the possibility of re-establishing the GTS circuits with NMCs Bogota and Quito using X.25 with speed up to 9600 bps.

5.2.5 The session was also informed that the circuits between RTH Buenos Aires and NMC Lima will be upgraded soon to 9600 bit/sec and that the circuits with NMCs Asuncion, La Paz and Montevideo would also be upgraded soon to the same characteristics.

5.2.6 The session was also informed about tests carried out between centres in the Region to assess the feasibility of using FTP via Internet to exchange meteorological information where GTS circuits are not operational. The session also discussed the possibilities of using the Internet to collect data from the climatological stations using facilities such as the Internet cafes that can now be found in very small cities in most countries of the Region at a very reasonable cost.

5.3 **Global Data-Drocessing System (GDPS)**

Report of the Rapporteur

5.3.1 The session regretted that Mr. R. Viñas (Venezuela) the Rapporteur for Regional Aspects of the Global Data Processing System was unable to carry out his activities of rapporteur and could not participate in the session. Mr. Tirso Carballo from Venezuela agreed to present the information collected concerning the development of the GDPS in the Region. Particular items of his report were considered under the relevant agenda items.

Global Data-processing and Forecasting Systems

5.3.2 The session noted that the two RA III RSMCs with geographical specialization: Brasilia and Buenos Aires provide regional products to assist NMCs in the forecasting of small-scale, mesoscale and large-scale meteorological systems. RSMC operations have shown sustained improvement.

5.3.3 The session was informed that RSMC Buenos Aires runs a LAM with 10 Levels up to 36 h. RSMC Buenos Aires is equipped with SGI Origin 2000 and Work stations SGI INDIGO, IRIS, INDY and PCs. A new model with 32 levels covering the area of responsibility of RSMC Buenos Aires will soon be operational with products being disseminated.

5.3.4 RSMC Brasilia runs a Meso-scale Model with a resolution of 25 Km up to 48 hours. The hidrostatic Limited Area Model (called MBAR) was developed in cooperation with the German Weather Service (DWD). RSMC Brasilia is equipped with new silicon Graphics multiprocessor systems and a CRAY SV-1. The Brazilian Institute for Space Research (INPE) in Sao Paulo runs a Global Model (GM-T126L28) up to 7 days, a Limited Area Model (LAM, 40km res., 38 levels, up to 60 h, over South America), and an Ensemble System (T62L28 coupled) with 25 members up to six months. The INPE is equipped with a NEC SX 4 and NEC SX 3.

5.3.5 The session noted that other centres in the Region have already started to run NWP models. Peru is running a MM5 model at the Geophysical Institute, an ETA and a CCM3 model at SENAMHI. Chile and Ecuador are also running a MM5 model. French Guiana is using model outputs from Toulouse. In general, RA III centres are making extensive use of the NWP generated inside and outside the Region.

5.3.6 RSMCs Montreal and Washington designated for the provision of transport model products in case of nuclear emergencies and other emergencies have implemented the global arrangements for the provision of products to RA III.

5.3.7 Some NMCs in RA III have now been equipped with a system based on inexpensive personal computers together with suitable software developed by Argentina and Brazil. Most of the NMCs in RA III can effectively use products from advanced GDPS Centres, which are available at RTHs or received through satellite based distribution system (ground receivers (VSAT) and user terminals from the International Satellite Communication System (ISCS). Through the ISCS, WMC Washington disseminates World Area Forecast Products and some additional products. Washington and INPE run a coupled ocean-atmosphere model and provide long-range predictions and seasonal outlooks; in particular related to El Nino predictions. These predictions are available on Internet.

5.3.8 RSMC Buenos Aires is a lead centre for monitoring land surface observations in RA III. The lead centres generate monthly or six-monthly reports on the results of data quality monitoring which are being distributed to Members concerned to initiate remedial action with respect to the suspect stations detected by the lead centres.

Ensemble Prediction Systems (EPS)

5.3.9 The session was informed that CBS-XII had addressed several issues concerning Ensemble Prediction Systems with a view to making ensemble prediction system products more widely available. A basic list of EPS products to be distributed should at least include probability of precipitation, ensemble mean at 500 hPa and some indication of variability (e.g. spaghetti plots, spread). Ranges to be covered are at least D4 (96 h) to D7 (168 h). The session was informed about the negotiations between the WMO Secretariat, the ECMWF and some RTHs to make EPS products soon available on the GTS. The session stressed the importance of training for effective use of these products and congratulated the efforts of the Secretariat in this respect. It was informed that a series of Seminars in this field is being planned similar to the one recently held in Beijing which was a complete success.

5.3.10 The session noted that EPS products will be distributed in GRIB format and for that reason centres in the Region should have adequate hardware and software to decode, process and display such products. The session requested the RTHs of the Region to start the contacts with RTH Washington to insert those products in the switching directories for transmission to RA III centres as soon as these products become available.

Severe Weather Forecasting

5.3.11 The session noted the concerns expressed by CBS-XII that some centres have the capabilities to do post processing, they do receive the GRIB data but might not be able to exploit the use of this data to their benefit yet. They are encouraged to develop value-added products adapted to their local needs. It encouraged centres that have only static display systems to upgrade to a post processing system because static display has several limitations. The session endorsed the position of the Commission encouraging exchange of visits of forecasters from centres that deal with forecasting of severe weather.

5.3.12 The session noted that CBS had created an action plan to facilitate co-ordinated implementation of procedures for assuring availability and use of NWP guidance on the occurrence of severe weather at NMHSs. The action plan, which emphasises the important role of protection of life and property contemplates the following steps:

- Urges Members to create or develop further GDPS facilities, taking into account the levels of expertise;
- Urges leading centres to assist other centres in developing more expertize;
- Recommends that the different centres assess their training needs for severe weather forecasts and convey them to the WMO Secretariat;
- Recommends that WMO set up training workshops ;
- Stresses the importance of severe weather forecasts and encourage centres to conduct research on their own local severe weather;

Long-range Forecasting

5.3.13 The session noted that several activities had been carried out in the Region concerning long-range forecasting, initially to fulfil the requirements of individual countries. However, several climatological fora have been carried out, specially in the southern part of the Region.

5.4 WWW Data Management (DM) including Codes

Report of the Rapporteur

5.4.1 The session thanked Mr. Mr. E. A. Grammetsbacher (Brazil) for his activities as regional rapporteur on the DM including code aspects. Particular items of his report were considered under the relevant agenda items.

5.4.2 The session noted that CBS-XII had recommended additions to FM 94 BUFR and FM 95 CREX Tables to improve the transmission of data from automatic stations, especially related to present weather to report observed quantities rather than qualitative parameters. In response to requirements stated by the Data Buoy Cooperation Panel (DBCP), the Commission recommended the inclusion of drifting buoy metadata information in FM 18 BUOY for implementation on 7 November 2001. The International Civil Aviation Organization (ICAO) had expressed requirements to amend the FM 15 METAR, FM 16 SPECI, FM 51 TAF code forms and to add a note to FM 53 ARFOR code form (explaining that a requirement by ICAO for this code does not exist). These amendments resulted from the changes in aeronautical requirements contained in ICAO Annex 3 — *Meteorological Service for International Air Navigation*/WMO Technical Regulations [C.3.1]. The Commission recommended the corresponding additions to FM 15 METAR, FM 16 SPECI, FM 51 TAF and FM 53 ARFOR for implementation on 1 November 2001.

5.4.3 The session was informed that CBS had agreed that the Edition 2 of FM 92 GRIB be adopted as an operational WMO code as from 7 November 2001. The Edition 2 of GRIB would enable the coding of new products, such as the output of ensemble prediction systems, long-range forecasts, climate predictions, ensemble wave forecasts and ocean models. It was noted however that GRIB Edition 1 was still a valid code and would remain in use.

5.4.4 The session noted Table Driven Codes BUFR (Binary Universal Form for the Representation of meteorological data) and CREX (Character form for the Representation and Exchange of data) offer great advantages compared to the traditional alphanumeric codes (e.g. FM12 SYNOP, FM18 BUOY, FM35 TEMP,…). It also noted that the table-driven codes are universal and flexible, and can be easily expanded to satisfy all observational requirements including national needs for specific data exchange. It stressed, however, that the effective use of the table-driven codes requires adequate computer capability and the traditional decoding processes does not apply anymore.

5.4.5 The session recalled that BUFR was initially approved by CBS-IX for operational use in November 1988. It has since been used mainly for satellite, aircraft and wind profiler observations, as well as for tropical cyclone information and for archiving of all types of observational data. CBS had recommended CREX as an operational data representation code form from 3 May 2000. CREX is being used for exchange of ozone data, radiological data, hydrological data, tide gauge data, tropical cyclone data and soil temperature data. CREX should be used in lieu of BUFR if binary data handling or transmission are not possible. The self-description, flexibility and expandability of these codes, are fundamental in light of the fast evolution of science and technology, which regularly request representation forms for new data types.

5.4.6 The session recognised that already at present, several new requirements cannot be met by traditional alphanumeric codes. Examples are new oceanographic data, atmospheric chemistry data, high time resolution data, specific climatological data and all kinds of metadata. BUFR and CREX can meet these requirements. In addition BUFR provides for condensation (packing) of the data and allows coding of quality flags and associated values. CREX offers direct human readability. To achieve the same functionality in traditional alpha-numeric codes would require substantive modifications, which would be far too costly. A change once and for all to the use of BUFR and CREX seems to be is the only solution in the longer term.

5.4.7 The session agreed that ultimately, all observations should be exchanged in BUFR, which offers more features than CREX, but this would still take quite some time as the use of BUFR requires data communication links supporting binary data and data processing capability. Many countries or agencies will need more time before being able to receive binary observations and a far longer period to be able to encode observations in BUFR. For some countries or agencies the use of CREX might be an interim solution.

5.4.8 The session noted that CBS had recommended a phased approach that would comprise progressive steps for a shift (or migration strategy) to the use of Table Driven Codes for transmission of observations, whereby synoptic data producers and originating/processing centres of ships, buoys, satellites and other new types of observing sensors and platforms would be invited to transmit data in BUFR or CREX. It also noted that CBS had already invited manufacturers of automatic and other observing platforms to take into account the coming shift to Table Driven Codes for their software development. The session agreed that the migration to Table Driven Codes will have implications in all the elements of the World Weather Watch system. It supported the CBS position that it should be a smooth transition without negative impacts on the World Weather Watch operations.

5.4.9 The session recognised that provision of and support for encoding and decoding software for the Table Driven Code forms was an indispensable part of any migration plan and that a successful migration to Table Driven Codes would depend on several supporting projects, new measures and assistance to Member Countries. These would have to include information dissemination, training, software distribution and possible assistance in implementation.

5.5 **WWW support activities, including Technical Co-operation and Operational Information Service**

5.5.1 The session was informed about the restructuring of the WMO Secretariat concerning the Technical Co-operation, Education and Training, and the relationship of these areas with the Regional Office for the Americas. This is expected to facilitate the development of capacity building projects. In this respect, a pilot project is being implemented between Brazil and Chile for training in the field of development and use of NWP models. The session welcome the offer made by Venezuela to provide through VCP modern Personal Computer equipment to Guyana and Suriname. It was requested the contribution of other Members concerning application software for such PCs.

5.5.2 The session was also informed about the improvements being introduced in the WMO operational information publications, specially in Volume A, at the request of CBS. It expressed satisfaction with the great quantity of operational information published on the WMO web server.

6. REGIONAL METEOROLOGICAL DATA COMMUNICATION NETWORK (RA III RMDCN)

Background

6.1 The session noted that RA III, at its twelfth session (Salvador, Brazil, 1997), decided to launch the project for the modernisation of its Regional Meteorological Telecommunication Network based on managed data-communication network services. It established a steering group to develop the new RMTN plan and requested the Secretary-General of WMO to provide support for the development of the project.

6.2 It noted that the Secretariat had already organised and supported several related events in RA III, culminating with the preparation of the project plan, including the documents required for the calling of the International Invitation To Bid (ITB). The Specification of Requirements document was submitted for comments to the 13 Members of RA III, receiving favourable and supportive responses from all Members. They firmly stated their preference that a "neutral" agency should be entrusted with the procurement process and the subsequent conclusion of the Framework Contract with the selected company. After the analysis of alternatives, the direct and active involvement of the WMO Secretariat was regarded as the most appropriate way forward. A proposal was consequently developed, approved by the Secretary-General and was submitted to RA III Members.

6.3 The session was informed about the circular letter sent the Secretary-General in July 2000 to all Members of RA III seeking their concurrence with the proposed project management framework and the corresponding course of action for the development of the RA III RMDCN Project. The letter also invited them to consider the participation of their respective countries in the implementation and operation of the new RA III RMDCN, especially their commitment or willingness to participate in the first operational or subsequent phase of the RMDCN. Twelve responses from a total of 13 were received, from which eight Members have indicated their willingness to participate in the initial phase of the project and four are willing to participate in the subsequent phase. Some Members have indicated that expert services, hardware and software support may be required for facilitating the implementation in their respective NMCs.

6.4 For ease of reference, a summary description of the agreed RA III RMDCN project as well as the project management framework are included in the annex to this paragraph.

6.5 The detailed planning of the project, including the analysis of the reply from RA III Members were submitted to the first session of the Working Group on Internal Matters of RA III (Santiago, 2-4 November 2000), which reviewed the project and made suggestions and recommendations. The following section includes relevant points extracted from the final report of the above-mentioned meeting.

Working Group on Internal Matters of RA III

6.6 The session was informed that the Working Group on Internal Matters of RA III had reviewed the development of the RA III RMDCN Project since the twelfth session of RA III (Salvador, Brazil, 1997), including the replies to the circular letter to Permanent Representatives of RA III in July 2000.

6.7 The session noted that the meeting in Santiago had identified the following key factors for the success of the project:

(i) The support of the Secretariat;

(ii) The number of Members committed to participate from the beginning of the project;

(iii) The services of a data-communication consultant, who would be appointed to assist in the evaluation of bids and to monitor the installation as well as to manage acceptance activities.

6.8 The session also noted that the working group meeting in Santiago had not been in a position to identify an appropriate funding mechanism. It welcomed, however, the suggestion that data-communication networking experts from the Region, in particular from RTHs Brasilia and Buenos Aires, could assist NMCs during the installation and commissioning of the new system.

6.9 The session also welcomed the outcome of the Working Group on Internal Matters reaffirming the importance of the project for the Region and inviting the president of RA III to request the Secretary General to carry out the international tender process and, subsequently, conclude the Framework Contract with the selected provider, on behalf of RA III Members.

Follow-up of the RA III RMDCN Project

6.10 The session noted that as a follow-up to the recommendations of the meeting of the Working Group on Internal Matters, the president of RA III had already requested the Secretary-General to proceed with the procurement process on behalf of RA III Members. It also noted that the Secretariat was establishing an internal Project Management Committee (PMC) to monitor and guide the Secretariat activities related to the project, as required by the adopted project management framework.

6.11 The procurement process, as agreed by Members, includes the International Invitation to Bid (ITB) to be issued by the Secretariat, the evaluation of the proposals, the selection of the provider, the conclusion of the Framework Contract by the Secretary- General and the National Contracts by Members.

6.12 The following actions are also required to enable progress in the procurement process:

(i) The establishment of the Contract Advisory Committee (CAC), to evaluate the proposals and advise on the selection of the best bid. The composition of the CAC, as agreed by Directors of NMHSs in the Santiago meeting, includes representatives of RTHs Brasilia, Buenos Aires and Maracay, representatives of NMCs Bogota and Santiago, and eventually the consultant, with the support from the Secretariat;

(ii) The identification of funds for supporting the data-communication consultant services, who will assist in the evaluation of bids and manage the installation and acceptance activities, and for supporting the required activities of the Steering Group on the RMDCN and the CAC.

6.13 With respect to the establishment of the Contract Advisory Committee (CAC), the session recommended that it would consist of the core members of the Steering Group on the RMDCN with

a view to facilitating co-ordination. The composition of the Steering Group is included in the Draft Resolution (XIII-RA III) in the annex to paragraph 6.15.

6.14 With respect to funding, the session discussed the establishment of a co-ordinated co-operation project, including a Trust Fund, in the framework of the WMO Technical Co-operation Programme with a view to supporting and facilitating the further development and implementation of the RMDCN project. This mechanism, hopefully supported by the co-operation assistance and contribution from Members, would enable data-communication consultant services and facilitate meetings of the Steering Group and the CAC as necessary, as well as implementation assistance at NMCs.

6.15 In view of the importance of the RMDCN project for the Region, the session decided to propose a draft Resolution for consideration by the forthcoming RA III. The text is included in the annex to this paragraph.

7. PUBLIC WEATHER SERVICES

Report of the Rapporteur

7.1 The session thanked Mr. Mr. J. Afonso (Argentina) for his activities as regional rapporteur on Public Weather Services. Particular items of his report were considered under the relevant agenda items.

7.2 The participants exchanged various experiences related to the visibility and authority of the NMHSs vis-a-vis other PWS providers that operate legally or illegally in the PWS domain. This included uncoordinated conduct of TV stations and other media, which chase sensational news and neglect scientific corroboration of their announcements by NMHSs. In several cases the result was serious misinformation of the general public and authorities.

7.3 The session recommended that the PWS Programme should place high priority on capacity building activities to assist Members to develop and improve their own public weather services. Special emphasis should be placed on training activities for NMHS personnel participate in media presentation and interviews. The session requested the WMO Secretariat to continue promoting courses and seminars on PWS like the recent one held in Buenos Aires with great success. The session expressed the view that the dissemination of public weather service activities would be enormously facilitated with the work of professional journalists at NMHSs.

8. FUTURE WORK PROGRAMME

8.1 The session discussed and recommended the different topics, which should be considered by XIII-RA III. The session further discussed its future work programme for the next period. It was agreed to propose to the Association to re-establish its Working Group on Planning and Implementation of the WWW in Region III at its eleventh session. To this end, the session developed a proposal for the Draft Resolution 1 (XII-RA III) which is attached in the annex to this paragraph.

8.2 The Draft Resolution contains the proposed terms of reference for the working group, a proposal for its core membership consisting of rapporteurs on each of the WWW components. The corresponding terms of reference for each of the rapporteurs are included in the annex to the Draft Resolution.

9. CLOSURE OF THE SESSION

9.1 The session closed at 12:00 of 27 April 2001.

Annex to paragraph 5.1.3

REGIONAL ASSOCIATION III (SOUTH AMERICA)

Status of implementation of the RBSN
(Based on Pub. 9 Vol. A - April 2001)

S(150 Km); WR(250 Km)

Number	Name	Proposed RBSN	Status
ARGENTINA			
87007	LA QUIACA OBSERVATORIO	S	OK
87016	ORAN AERO	S	IS
87022	TARTAGAL AERO		OK
87046	JUJUY AERO	S	OK
87047	SALTA AERO	S	OK
87047	SALTA AERO	WR	NO
87065	RIVADAVIA	S	IS
87078	LAS LOMITAS	S	OK
87097	IGUAZU AERO	S	OK
87121	TUCUMAN AERO	S	OK
87129	SANTIAGO DEL ESTERO AERO.	S	OK
87148	PRES.ROQUE SAENZ PENA Ap *	S	OK
87149	PRES.ROQUE SAENZ PE		NO
87155	RESIST.AERO.	S	OK
87155	RESISTENCIA AERO.	WR	IR
87162	FORMOSA AERO	S	OK
87171	GENERAL PAZ	S	IS
87178	POSADAS AERO.	S	OK
87211	TINOGASTA	S	IS
87217	LA RIOJA AERO.	S	OK
87222	CATAMARCA AERO.	S	OK
87244	VILLA DE MARIA DEL RIO SECO	S	OK
87257	CERES AERO	S	OK
87270	RECONQUISTA AERO	S	OK
87286	CURUZU CUATIA	S	OK
87289	PASO DE LOS LIBRES AERO	S	OK
87305	JACHAL	S	IS
87311	SAN JUAN AERO	S	OK
87320	CHAMICAL AERO	S	OK
87322	CHEPES	S	IS
87328	VILLA DOLORES AERO	S	IS
87344	CORDOBA AERO	S	OK
87344	CORDOBA AERO	WR	NO
87349	PILAR OBSERVATORIO		OK
87371	SAUCE VIEJO AERO		OK
87374	PARANA AERO	S	OK
87385	VILLAGUAY	S	IS
87393	MONTE CASEROS AERO		OK
87395	CONCORDIA AERO	S	OK
87412	SAN CARLOS	S	IS
87416	SAN MARTIN		OK
87418	MENDOZA AERO	S	OK
87418	MENDOZA AERO	WR	NO
87436	SAN LUIS AERO	S	OK
87448	VILLA REYNOLDS AERO	S	OK
87453	RIO CUARTO	S	OK
87467	MARCOS JUAREZ AERO	S	OK
87480	ROSARIO AERO	S	OK

Number	Name	Proposed RBSN	Status
ARGENTINA (Cont.)			
87506	MALARGUE AERO	S	OK
87509	SAN RAFAEL AERO	S	OK
87532	GENERAL PICO	S	IS
87534	LABOULAYE	S	OK
87544	PEHUAJO	S	IS
87548	JUNIN AERO	S	OK
87563	LAS FLORES AERO	S	OK
87576	EZEIZA AERO	S	OK
87576	EZEIZA AERO	WR	OK
87582	AERPARQUE BASE BS.		OK
87596	PUNTA INDIO	S	OK
87593	LA PLATA AEROP.		OK
87623	SANTA ROSA	S	OK
87623	SANTA ROSA	WR	NO
87640	BOLIVAR AERO	S	OK
87641	AZUL AERO		OK
87645	TANDIL AERO	S	OK
87648	DOLORES AERO	S	OK
87659	FARO PTA.MEDANOS	S	IS
87679	PIGUE	S	IS
87688	TRES ARROYOS	S	OK
87692	MAR DEL PLATA AERO	S	OK
87715	NEUQUEN AERO	S	OK
87715	NEUQUEN AERO	WR	NO
87736	RIO COLORADO	S	IS
87743	FARO EL RINCON	S	IS
87750	BAHIA BLANCA AERO	S	OK
87765	BARILOCHE AERO	S	OK
87774	MAQUINCHAO	S	OK
87784	SAN ANTONIO OESTE AERO	S	OK
87791	VIEDMA AERO	S	OK
87803	ESQUEL AERO	S	OK
87814	PASO DE INDIOS	S	IS
87828	TRELEW AERO	S	OK
87852	PERITO MORENO AERO	S	OK
87860	COMODORO RIVADAVIA AERO	S	OK
87860	COMODORO RIVADAVIA AERO	WR	NO
87880	GOBERNADOR GREGORES	S	OK
87896	PUERTO DESEADO	S	SI
87903	LAGO ARGENTINO	S	OK
87909	SAN JULIAN	S	OK
87912	STA CRUZ	S	IS
87925	RIO GALLEGOS AERO	S	OK
87928	FARO CABO VIRGENES	S	IS
87934	RIO GRANDE	S	OK
87938	USHUAIA AERO	S	OK
BOLIVIA			
85033	GUAYARAMERIN	S	IS
85041	COBIJA	S	IS
85043	RIBERALTA	S	IS
85104	SAN JOAQUIN	S	IS
85114	MAGDALENA	S	IS
85123	SANTA ANA	S	IS
85141	RURRENABAQUE	S	IS
85151	APOLO	S	IS

Number	Name	Proposed RBSN	Status
BOLIVIA (Cont.)			
85152	SAN BORJA	S	IS
85154	TRINIDAD	S	IS
85175	ASCENCION DE GUARAYOS	S	IS
85196	CONCEPCION	S	IS
85201	LA PAZ/ALTO	S	OK
85201	LA PAZ/ALTO	WR	IR
85207	SAN IGNACIO DE VELASCO	S	IS
85210	SAN MATIAS	S	IS
85223	COCHABAMBA	S	OK
85230	CHARANA	S	IS
85242	ORURO	S	IS
85245	SANTA CRUZ/EL TROMPILLO	S	IS
85245	SANTA CRUZ/EL TROMPILLO	WR	NO
85247	SAN JOSE DE CHIQUITOS	S	IS
85264	VALLEGRANDE	S	IS
85268	ROBORE	S	IS
85283	SUCRE	S	IS
85293	POTOSI	S	IS
85315	CAMIRI	S	IS
85345	VILLAMONTES	S	IS
85364	TARIJA	S	IS
85365	YACUIBA	S	IS
85394	BERMEJO	S	IS
BRAZIL			
82022	BOA VISTA (AEROPORTO)	WR	NO
82024	BOA VISTA	S	IS
82030	AMAPA	S	NO
82042	CARACARAI	S	IS
82067	IAUARETE	S	IS
82094	PONTA DO CEU	S	IS
82098	MACAPA	S	IS
82100	PARI CACHOEIRA	S	IS
82106	SAO GABRIEL DA CACHOEIRA	S	IS
82108	TAPURUCUARA	S	NO
82113	BARCELOS	S	IS
82141	SOURE	S	NO
82143	SALINOPOLIS	S	NO
82145	TRACUATEUA (BRAGANCA)	S	IS
82178	OBIDOS	S	IS
82181	MONTE ALEGRE	S	IS
82184	PORTO DE MOZ	S	IS
82191	BELEM	S	IS
82193	BELEM (AEROPORTO)	WR	OK
82198	TURIACU	S	IS
82212	FONTE BOA	S	IS
82240	PARINTINS	S	IS
82244	SANTAREM AP	S	
82246	BELTERRA	S	IS
82263	CAMETA	S	IS
82277	FAROL SANTANA	S	IS
82280	SAO LUIZ (AEROPORTO)	S	OK
82281	SAO LUIZ (AEROPORTO)	WR	IR
82287	PARNAIBA	S	OK
82317	TEFE	S	NO
82326	CODAJAS	S	IS

Number	Name	Proposed RBSN	Status
BRAZIL (Cont.)			
82331	MANAUS	S	IS
82332	MANAUS (AEROPORTO)	WR	OK
82336	ITACOATIARA	S	IS
82353	ALTAMIRA	S	IS
82361	TUCURUI	S	IS
82376	ZE DOCA	S	IS
82392	SOBRAL	S	IS
82397	FORTALEZA (AEROPORTO)	WR	
82398	FORTALEZA (AEROPORTO)	S	OK
82400	FERNANDO DE NORONHA	S	OK
82400	FERNANDO DE NORONHA	WR	OK
82410	BENJAMIN CONSTANT		IS
82418	CARAUARI	S	NO
82425	COARI	S	IS
82445	ITAITUBA	S	IS
82460	BACABAL	S	IS
82476	CAXIAS	S	NO
82480	PIRIPIRI	S	IS
82493	JAGUARUANA	S	NO
82533	MANICORE	S	IS
82562	MARABA	S	IS
82564	IMPERATRIZ	S	IS
82568	GRAJAU	S	IS
82571	BARRA DO CORDA	S	IS
82579	TERESINA (AEROPORTO)	S	OK
82583	CRATEUS	S	NO
82586	QUIXERAMOBIM	S	IS
82594	MACAU	S	IS
82595	CALCANHAR	S	IS
82599	NATAL AEROPORTO	S	OK
82599	NATAL AEROPORTO	WR	IR
82610	EIRUNEPE	S	IS
82640	JACAREACANGA AP	S	OK
82688	SAO FELIX XINGU	S	IS
82678	FLORIANO	S	IS
82678	FLORIANO	WR	IR
82683	TAUA	S	IS
82686	IGUATU	S	IS
82689	SAO GONCALO	S	IS
82693	CRUZETA	S	IS
82704	CRUZEIRO DO SUL	S	IS
82723	LABREA	S	IS
82765	CAROLINA	WR	IR
82765	CAROLINA	S	IS
82768	BALSAS *		NO
82771	URUCUI	S	IS
82780	PICOS	S	IS
82784	BARBALHA	S	IS
82789	TRIUNFO	S	IS
82791	PATOS	S	IS
82795	CAMPINA GRANDE	S	IS
82798	JOAO PESSOA	S	IS
82807	TARAUACA	S	IS
82824	PORTO VELHO (AEROPORTO)	S	OK
82824	PORTO VELHO (AEROPORTO)	WR	IR
82861	CONCEICAO DO ARAGUAIA	S	IS

Number	Name	Proposed RBSN	Status
BRAZIL (Cont.)			
82863	PEDRO AFONSO	S	IS
82879	S.JOAO DO PIAUI	S	IS
82882	PAULISTANA	S	IS
82886	CABROBO	S	IS
82893	GARANHUNS	S	IS
82899	RECIFE (AEROPORTO)	S	IS
82900	RECIFE		OK
82900	RECIFE	WR	IR
82917	RIO BRANCO	S	IS
82927	COTRIGUACU *	S	NO
82965	ALTA FLORESTA (AEROPORTO)	S	IS
82965	ALTA FLORESTA (AEROPORTO)	WR	IR
82970	ALTO PARNAIBA *	S	NO
82975	BOM JESUS	S	IS
82976	CARACOL	S	IS
82979	REMANSO	S	IS
82983	PETROLINA	S	IS
82983	PETROLINA	WR	IR
82986	PAULO AFONSO	S	IS
82993	MACEIO (AEROPORTO)	S	OK
83036	SAO SEBASTIAO	S	IS
83064	PORTO NACIONAL	S	IS
83076	IBIPETUBA	S	IS
83090	MONTE SANTO	S	IS
83096	ARACAJU	S	IS
83097	PROPRIA	S	IS
83179	BARRA	S	IS
83182	IRECE	S	IS
83186	JACOBINA	S	IS
83190	SERRINHA	S	IS
83192	CIPO *		NO
83195	ITABAIANINHA	S	IS
83208	VILHENA (AEROPORTO)	S	IS
83208	VILHENA (AEROPORTO)	WR	IR
83214	MATUPA *	S	NO
83228	PEIXE	S	IS
83229	SALVADOR	S	IS
83229	SALVADOR	WR	IR
83231	PARANA	S	IS
83235	TAGUATINGA	S	IS
83236	BARREIRAS	S	IS
83242	LENCOIS	S	IS
83244	ITABERABA	S	IS
83248	SALVADOR (AEROPORTO)		OK
83264	GLEBA CELESTE	S	IS
83270	CANARANA *	S	NO
83286	CORRENTINA	S	IS
83288	BOM JESUS DA LAPA	S	IS
83288	BOM JESUS DA LAPA	WR	IR
83292	ITUACU	S	IS
83295	JAGUAQUARA	S	IS
83302	ALCOMAT *	S	NO
83309	DIAMANTINO	S	IS
83319	NOVA XAVANTINA *	S	NO
83332	POSSE	S	IS
83334	FORMOSO	S	IS

Number	Name	Proposed RBSN	Status
BRAZIL (Cont.)			
83338	ESPINOSA *		NO
83339	CAETITE	S	IS
83344	VITORIA DA CONQUISTA	S	IS
83349	ILHEUS (AEROPORTO)	S	IS
83358	POXOREO (POXOREU)	S	IS
83361	CUIABA	S	IS
83362	CUIABA (AEROPORTO)	WR	IR
83368	ARAGARCAS	S	IS
83374	GOIAS	S	IS
83376	PIRENOPOLIS	S	IS
83378	BRASILIA (AEROPORTO)	S	OK
83378	BRASILIA (AEROPORTO)	WR	OK
83384	ARINOS	S	IS
83386	JANUARIA	S	IS
83388	MONTE AZUL	S	IS
83393	PEDRA AZUL	S	IS
83398	CANAVIEIRAS	S	IS
83405	CACERES	S	IS
83408	CARINHANHA	S	IS
83423	GOIANIA	S	IS
83437	MONTES CLAROS	S	IS
83442	ARACUAI	S	IS
83464	JATAI *	S	NO
83467	LIMEIROS	S	NO
83470	RIO VERDE	S	NO
83479	PARACATU	S	IS
83483	PIRAPORA	S	IS
83488	ITAMARANDIBA	S	IS
83492	TEOFILO OTONI	S	IS
83497	CARAVELAS (AEROPORTO)	S	OK
83497	CARAVELAS (AEROPORTO)	WR	NO
83512	COXIM	S	IS
83513	NHUMIRIM		NO
83514	CAPINOPOLIS	S	IS
83522	IPAMERI	S	IS
83526	CATALAO	S	IS
83531	PATOS DE MINAS	S	IS
83538	DIAMANTINA	S	IS
83543	GOVERNADOR VALADARES	S	IS
83550	SAO MATEUS	S	IS
83565	PARANAIBA	S	IS
83566	BELO HORIZONTE (CONFINS) *	WR	NO
83570	POMPEU	S	IS
83574	FRUTAL	S	IS
83577	UBERABA	S	IS
83579	ARAXA	S	IS
83582	BAMBUI	S	IS
83587	BELO HORIZONTE	S	IS
83592	CARATINGA	S	IS
83595	AIMORES	S	IS
83612	CAMPO GRANDE (AEROPORTO)	S	OK
83612	CAMPO GRANDE (AEROPORTO)	WR	OK
83618	TRES LAGOAS	S	IS
83623	VOTUPORANGA	S	IS
83630	FRANCA	S	IS
83642	VICOSA	S	IS

Number	Name	Proposed RBSN	Status
BRAZIL (Cont.)			
83646	CACHOEIRO ITAREMIRIM	S	IS
83649	VITORIA (AEROPORTO)	S	OK
83650	TRINDADE (ILHA)	S	OK
83650	TRINDADE (ILHA)	WR	IR
83659	DOURADOS	S	IS
83660	MARAMBAIA		IS
83676	CATANDUVA	S	IS
83683	MACHADO	S	IS
83687	LAVRAS	S	IS
83692	JUIZ DE FORA	S	IS
83695	ITAPERUNA		IS
83698	CAMPOS	S	IS
83704	IVINHEMA	S	IS
83714	CAMPOS DO JORDAO	S	IS
83716	PRESIDENTE PRUDENTE	S	IS
83718	CORDEIRO		IS
83721	CAMPINAS (AEROPORTO)	S	OK
83722	BAURU *	S	NO
83726	SAO CARLOS	S	IS
83738	RESENDE	S	IS
83744	ILHA RASA	S	IS
83746	GALEAO	WR	OK
83759	SP ALDEIA AERO	S	IS
83766	LONDRINA	S	IS
83767	MARINGA	S	IS
83769	JACAREZINHO	S	IS
83773	AVARE	S	IS
83774	ITAPEVA	S	IS
83780	SAO PAULO (AEROPORTO)	S	OK
83780	SAO PAULO (AEROPORTO)	WR	OK
83782	SANTOS	S	OK
83783	CAMPO MOURAO	S	IS
83811	IVAI	S	IS
83813	CASTRO		IS
83821	IGUAPE	S	IS
83827	FOZ DO IGUACU (AEROPORTO)	WR	IR
83828	TOLEDO	S	NO
83836	IRATI	S	IS
83840	CURITIBA (AEROPORTO)	S	OK
83840	CURITIBA (AEROPORTO)	WR	OK
83844	PARANAGUA		IS
83860	PALMAS	S	NO
83867	RIO NEGRO	S	IS
83872	INDAIAL	S	IS
83881	IRAI	S	IS
83883	CHAPECO		IS
83887	CAMPOS NOVOS	S	IS
83899	FLORIANOPOLIS (AEROPORTO)	S	OK
83907	SAO LUIZ GONZAGA	S	IS
83912	CRUZ ALTA	S	IS
83914	PASSO FUNDO	S	IS
83919	BOM JESUS	S	IS
83925	SANTA MARTA	S	IS
83927	URUGUAIANA	S	IS
83931	ALEGRETE	S	NO
83936	SANTA MARIA	S	IS

Number	Name	Proposed RBSN	Status
BRAZIL (Cont.)			
83948	TORRES	S	IS
83953	SANTANA DO LIVRAMENTO	S	IS
83964	ENCRUZILHADA DO SUL	S	IS
83970	MOSTARDAS	S	IS
83971	PORTO ALEGRE (AEROPORTO)	S	OK
83971	PORTO ALEGRE (AEROPORTO)	WR	OK
83980	BAGE	S	IS
83995	RIO GRANDE	S	IS
83997	ST.VITORIA DO PALMAR	S	IS
CHILE			
85406	ARICA	S	OK
85418	IQUIQUE	S	OK
85432	CALAMA	S	IS
85442	ANTOFAGASTA	S	OK
85442	ANTOFAGASTA	WR	IR
85460	CHANARAL	S	IS
85469	ISLA DE PASCUA	S	IS
85469	ISLA DE PASCUA	WR	IR
85470	COPIAPO	S	IS
85486	VALLENAR	S	IS
85488	LA SERENA	S	OK
85543	QUINTERO	S	NO
85574	PUDAHUEL	S	OK
85585	ISLA JUAN FERNANDEZ	S	IS
85585	ISLA JUAN FERNANDEZ	WR	NO
85586	SANTO DOMINGO	S	IS
85586	SANTO DOMINGO	WR	OK
85629	CURICO	S	OK
85672	CHILLAN	S	IS
85682	CONCEPCION	S	OK
85682	CONCEPCION	WR	NO
85743	TEMUCO	S	OK
85766	VALDIVIA	S	IS
85799	PUERTO MONTT	S	OK
85799	PUERTO MONTT	WR	OK
85834	ISLA HUAFO *	S	NO
85864	COYAHIQUE	S	NO
85892	COCHRANE	S	IS
85930	ISLOTES EVANGELISTAS	S	OK
85934	PUNTA ARENAS	S	OK
85934	PUNTA ARENAS	WR	IR
85972	ISLA DIEGO RAMIREZ	S	OK
COLOMBIA			
80009	SANTA MARTA/SIMON BOLIVAR	S	IS
80022	CARTAGENA/RAFAEL NUNEZ	S	OK
80028	BARRANQUILLA/ERNESTO CORTISSOZ	S	OK
80035	RIOHACHA/ALMIRANTE PADILLA	S	IS
80035	RIOHACHA/ALMIRANTE PADILLA	WR	IR
80036	VALLEDUPAR/ALFONSO LOPEZ	S	IS
80063	MONTERIA/LOS GARZONES	S	IS
80084	APARTADO/LOS CEDROS	S	IS
80089	OTU *	S	IS
80094	BUCARAMANGA/PALONEGRO	S	IS
80099	ARAUCA/SANTIAGO PEREZ	S	IS

Number	Name	Proposed RBSN	Status
COLOMBIA (Cont.)			
80112	RIONEGRO/J.M.CORDOVA	S	OK
80139	PUERTO CARRENO/A.GUAUQUEA	S	IS
80144	QUIBDO/EL CARANO	S	IS
80210	PEREIRA/MATECANA	S	IS
80214	IBAGUE/PERALES	S	IS
80222	BOGOTA/ELDORADO	S	OK
80222	BOGOTA/ELDORADO	WR	OK
80234	VILLAVICENCIO/VANGUARDIA	S	IS
80241	LAS GAVIOTAS	S	IS
80252	BUENAVENTURA	S	IS
80259	CALI/ALFONSO BONILLA ARAGON	S	OK
80308	POPAYAN/MACHANGARA *	S	IS
80315	NEIVA/BENITO SALAS	S	IS
80322	SAN JOSE DEL GUAVIARE	S	IS
80337	TUMACO *	S	IS
80342	PASTO/ANTONIO NARINO	S	IS
80361	MITU *	S	NO
80372	PUERTO ASIS	S	IS
80398	LETICIA/VASQUEZ COBO	S	IS
80398	LETICIA/VASQUEZ COBO	WR	IR
ECUADOR			
84001	SEYMOUR AEROPUERTO (GALAPAGOS)	S	IS
84008	SAN CRISTOBAL (GALAPAGOS)	S	IS
84008	SAN CRISTOBAL (GALAPAGOS)	WR	IR
84018	ESMERALDAS AEROPUERTO (TACHINA)	S	IS
84071	QUITO AEROPUERTO	S	OK
84099	EL COCA AEROPUERTO	S	IS
84101	BAHIA DEL CARAQUEZ AEROPUERTO	S	IS
84132	NUEVO ROCAFUERTE	S	IS
84140	PICHILINGUE	S	IS
84179	PUYO	S	IS
84200	SALINAS AEROPUERTO	S	IS
84203	GUAYAQUIL AEROPUERTO	S	IS
84203	GUAYAQUIL AEROPUERTO	WR	NO
84239	CUENCA AEROPUERTO	S	IS
84265	CATAMAYO AEROPUERTO (LA TOMA)	S	IS
FRENCH GUIANA			
81401	SAINT-LAURENT-DU-MARONI	S	IS
81405	ROCHAMBEAU	S	OK
81405	ROCHAMBEAU	WR	OK
81408	SAINT GEORGES DE L'OYAPOCK	S	IS
81415	MARIPASOULA	S	IS
GUYANA			
81002	TIMEHRI/CHEDDI JAGAN INTERNATIONAL	S	OK
81002	TIMEHRI/CHEDDI JAGAN INTERNATIONAL	WR	NO
81005	KAMARANG	S	IS
81006	LETHEM	S	IS
81010	EBINI	S	IS
81080	KAIETEUR FALLS	S	IS
81100	MABARUMA	S	IS
ISLANDS	(88: 800 - 998)		
88889	MOUNT PLEASANT AIRPORT	S	OK

Number	Name	Proposed RBSN	Status
ISLANDS (Cont.)			
88889	MOUNT PLEASANT AIRPORT	WR	OK
88903	GRYTVIKEN	S	IS
PARAGUAY			
86011	BASE 5 "GRAL A.JARA"	S	OK
86017	NUEVA ASUNCION	S	NO
86033	BAHIA NEGRA	S	OK
86065	PRATS-GIL	S	OK
86068	MARISCAL ESTIGARRIBIA	S	OK
86086	PUERTO CASADO	S	OK
86097	PEDRO JUAN CABALLERO	S	IS
86107	FORTIN GRAL DIAZ	S	NO
86125	POZO COLORADO	S	IS
86134	CONCEPCION	S	OK
86170	GRAL. BRUGUEZ *	S	NO
86185	SAN PEDRO		OK
86192	SAN ESTANISLAO	S	IS
86210	SALTOS DEL GUAIRA	S	OK
86218	ASUNCION/AEROPUERTO	S	OK
86218	ASUNCION/AEROPUERTO	WR	IR
86233	VILLARRICA	S	OK
86246	AEROPUERTO INT. GUARANI		OK
86255	PILAR		IS
86260	SAN JUAN BAUTISTA MISIONES	S	OK
86285	CAPITAN MEZA	S	IS
86297	ENCARNACION	S	OK
PERU			
84331	ANDOAS	S	
84370	TUMBES	S	OK
84377	IQUITOS	S	OK
84377	IQUITOS	WR	NO
84390	TALARA	S	OK
84396	REQUENA	S	IS
84401	PIURA	S	OK
84405	HUANCABAMBA	S	IS
84425	YURIMAGUAS	S	IS
84440	RIOJA *	S	IS
84444	CHACHAPOYAS	S	IS
84452	CHICLAYO	S	OK
84472	CAJAMARCA	S	IS
84474	JUANJUI	S	IS
84478	CONTAMANA	S	IS
84501	TRUJILLO	S	OK
84505	SANTIAGO DE CHUCO	S	IS
84515	PUCALLPA	S	OK
84531	CHIMBOTE	S	IS
84534	TINGO MARIA	S	IS
84542	ANTA (HUARAZ)	S	IS
84560	PUERTO ESPERANZA	S	IS
84564	HUANUCO	S	IS
84567	PUERTO BERMUDEZ	S	IS
84570	CERRO DE PASCO	S	IS
84593	ATALAYA	S	IS
85600	MATUCANA		IS
84628	LIMA-CALLAO/AP. INT J.Chavez	S	OK

Number	Name	Proposed RBSN	Status
PERU (Cont.)			
84628	LIMA-CALLAO/AP. INT J.Chavez	WR	IR
84630	HUAYO	S	IS
84658	PUERTO MALDONADO	S	OK
84670	QUILLABAMBA	S	IS
84673	AYACUCHO	S	IS
84677	QUINCEMIL	S	IS
84680	CASTROVIRREYNA	S	IS
84686	CUZCO	S	OK
84691	PISCO	S	OK
84695	ANTABAMBA	S	IS
84705	PAQUIO	S	IS
84710	YAURI	S	IS
84721	SAN JUAN	S	IS
84735	JULIACA	S	IS
84752	AREQUIPA	S	OK
84760	MAZO CRUZ	S	IS
84775	PUNTA COLES	S	IS
SURINAME			
81202	NICKERIE	S	OK
81209	STOELMANSEILAND	S	OK
81225	ZANDERIJ	S	OK
81250	TAFELBERG	S	OK
81251	SIPALIWINI	S	OK
81253	COEROENI	S	OK
81260	KABALEBO	S	IS
URUGUAY			
86330	ARTIGAS	S	OK
86370	TACUAREMBO	S	IS
86440	MELO	S	IS
86460	PASO DE LOS TOROS	S	OK
86500	TREINTA Y TRES	S	OK
86545	FLORIDA	S	OK
86560	COLONIA	S	OK
86565	ROCHA	S	OK
86580	CARRASCO	S	OK
VENEZUELA			
80403	CORO	S	OK
80405	LA ORCHILA	S	OK
80410	BARQUISIMETO	S	OK
80413	MARACAY - B.A. SUCRE	S	OK
80413	MARACAY - B.A. SUCRE	WR	OK
80415	CARACAS/MAIQUETIA AP.INT S.Bolivar	S	OK
80419	BARCELONA	S	OK
80421	PORLAMAR (AP. DEL CARIBE	S	OK
80423	GUIRIA	S	OK
80425	MENE GRANDE	S	OK
80428	GUANARE	S	OK
80434	VALLE DE LA PASCUA	S	IS
80435	MATURIN	S	OK
80438	MERIDA	S	OK
80442	CALABOZO	S	OK
80444	CIUDAD BOLIVAR	S	OK
80447	SAN ANTONIO DEL TACHIRA	S	OK

Number	Name	Proposed RBSN	Status
VENEZUELA (Cont.)			
80447	SAN ANTONIO DEL TACHIRA	WR	IR
80450	SAN FERNANDO DE APURE	S	OK
80453	TUMEREMO	S	OK
80457	PUERTO AYACUCHO	S	OK
80462	SANTA ELENA DE UAIREN	S	OK
80462	SANTA ELENA DE UAIREN	WR	IR
80476	LA CANADA	S	OK
80476	LA CANADA	WR	IR
80478	TEMBLADOR	S	OK

STATUS OF IMPLEMENTATION OF THE PROPOSED RBSN

Type of observation:

Surface:	507
Radiowind only	0
Radiowind+Radiosonde	58
Total stations	**565**

Programme Request:

S=Surface ; W=Radiowind; R=Radiosonde

Status of Implementation Surface	
OK=All obs. Done;	190
IS= Insuficient obs.done	291
NO=No obs. done	26
Total	**507**

Status of Implementation RadiowindRadiosonde:

OK=All obs. Done;	16
IR= Insuficient obs.done	28
NO=No obs. done	14
Total	**58**

Note
IS,IW,IR=Insuficient obs. done
*NO for WR stations: NO = No obs. done for either W or R or both unspecified.

STATUS REPORT OF THE SPACE-BASED SEGMENT

CMA Status Report

Current Status of FY-1C

FY-1C, the third Chinese polar orbiting meteorological satellite, was successfully launched on 10 May 1999. The satellite has been in good condition since it was launched. The satellite passed the on-orbit test and checkout period perfectly. Now it is operating well. So far, the CHRPT (High Resolution Picture Transmission of FY-1C) and GDPT (Global Delayed Picture Transmission) data have been received and provided to users day and night for over 16 months. The data processing system in China has produced many products for research and applications in meteorology & hydrology, climate analysis, agriculture production and environmental monitoring. CHRPT data transmission is open to all users worldwide.

The Multi-channel Visible and IR Scan Radiometer (MVISR) is the major sensor of FY-1C. There are 10 channels including 4 visible channels, 3 near IR channels, 1 short wave IR channel and 2 long wave IR channels. The onboard data storage capacity of FY-1C was increased to 300 minutes (compared with 60 minutes for FY-1A/B). This means that besides the real time CHRPT data received within the acquisition areas of three ground stations in Beijing, Guangzhou and Urumuqi, it is possible to receive global coverage data of four selected channels (channels 1,2,4 and 5) with reduced resolution. This data is defined as Global Delayed Picture Transmission (GDPT). The resolution of GDPT data is about 4 km along each scan line.

Future Polar Orbiting Meteorological Satellite

The fourth satellite of the first generation of Chinese polar orbiting satellite, FY-1D is scheduled to be launched in 2001. All the characteristics of FY-1D are the same as those of FY-1C. Planning for developing China's second generation of polar orbiting meteorological satellite FY-3 series was started a few years ago. Presently, the first two satellites of the series and on-board instruments are being designed and manufactured. According to current plan, the FY-3 series will take a two-phase strategy to develop.

Phase-I (2004-2008): Two satellites will be manufactured with limited sounding capabilities. These first two satellites (FY-3A&B) are defined as experimental satellites, mainly for test of new instruments.

Mission of development of FY-3 series

The main mission objectives of FY-3 include:

- To provide global sounding of 3-dimensional atmospheric thermal and moisture structures, cloud and precipitation parameters, in order to support global numerical weather prediction.
- To provide global imagery to monitor large-scale meteorological and/or hydrological disasters and biosphere and environment anomaly.
- To derive important geophysical parameters to support research on global and regional climate change.
- To collect and relay important data.

EUMETSAT Status Report

EPS Programme and Development Status

The EUMETSAT Polar System (EPS) is the European contribution to the Initial Joint Polar System (IJPS) established with NOAA, and the first European contribution to the follow-up Joint

Polar System (JPS) expected to be formed with the US "Converged" NPOESS system. The IJPS and JPS will provide global meteorological and climate data from a series of European and American sun-synchronous polar orbiting satellites, replacing the current NOAA K-L-M series.

The EPS system is composed of a space segment, based on three successive Meteorological Operational (Metop) satellites, and a ground segment.

The first Metop satellite (Metop-1) is being developed in the framework of the Metop-1 Programme of the European Space Agency (ESA), in cooperation with EUMETSAT. The Metop satellite is a 4.5-ton class satellite carrying a payload of about 900 kg. Its orbit is sun-synchronous with an inclination of 98.7^{o} and an Equator local crossing time at 09.30 hrs. It communicates with ground in S, L and X bands, for command and control, local (direct broadcast) dissemination and global acquisition.

The satellite design is based on the heritage of the SPOT-5 and ENVISAT programmes. The payload consists of a suite of 10 instruments, including a visible and IR imager (AVHRR/3), microwave (MHS, AMSU-A and GRAS), IR (HIRS and IASI) and UV (GOME-2) sounders, a C-band dual swath scatterometer (ASCAT), data collection (ARGOS) and S&R transponders and the Space Environment Monitor.

Metop is equipped with two direct broadcast facilities: Low Resolution Picture Transmission (LRPT) at 137 MHz and High Resolution Picture Transmission (HRPT) at approximately 1700 MHz.

NOAA/NESDIS Status Report

Polar Operational Environmental Satellite (POES)

The POES spacecraft constellation includes two primary, two secondary and one standby spacecraft. These spacecraft are in sun-synchronous orbits inclined at approximately 98° (retrograde). The primary operational spacecrafts, NOAA-14 and NOAA-15, are in sun-synchronous afternoon and morning orbits, respectively. Two secondary spacecraft, NOAA-11 and NOAA-12, provide additional payload operational data, while the standby spacecraft, NOAA-10, supports minimal SAR functions and is only contacted once a week.

The next satellite in the series, NOAA-L, was launched on 15 September 2000. This spacecraft has been renamed NOAA-16 and replaces NOAA-14 as the operational afternoon spacecraft. NOAA-M is scheduled for launch readiness by late Spring/early Summer of 2001.

NOAA-15

NOAA-15 was launched on 13 May 1998. By July 1998, NOAA-15 was designated as the operational replacement for NOAA-12. As such, it operates in an orbit with a 7:30 am descending node (morning orbit) and utilizes a similar set of instruments as NOAA-12 with the addition of the AMSU and ATOVS sounding system. Recent anomalous instrument behavior and the on-orbit failure of three high gain downlink antennas on NOAA-15 prompted the recall of NOAA-12 to support the morning orbit operational mission. At the current time, NOAA-12 instrument data is used to complement the operational data from NOAA-15

NOAA-14

NOAA-14, which was launched in December 1994, is the operational afternoon (ascending node) spacecraft. One of the two on-board processors (OBP) is unusable due to the malfunction of an associated command demodulator.

NOAA-12

By the end of July 2000, continuing instrument problems on NOAA-15, prompted the recall of NOAA-12 to operational status. Launched in May 1991, NOAA-12's AVHRR is currently being used to satisfy morning mission user data requirements.

Future POES System

NOAA has in place a follow-on polar satellite program to replace current satellites as they reach the end of their operational life. The new fifth-generation POES ATN follow-on satellites are designated NOAA-K, -L, -M, -N, and –N'. NOAA-K, -L, and -M will be upgraded with new primary environmental instruments, followed by NOAA-N and N' updated to a later instrument baseline.

NOAA-K, now designated NOAA-15, and NOAA-L now designated NOAA-16, were successfully launched in May 1998 and in September 2000, respectively. The planning launch dates for the remaining ATN follow-on satellites are as follows:

NOAA-M	May 2001
NOAA-N	December 2003
NOAA-N'	January 2008

Defense Meteorological Satellite Program (DMSP)

Over the last three years, NOAA and the US Air Force successfully completed the safe and efficient convergence of the five Defense Meteorological Satellite Program (DMSP) military satellites into the NOAA meteorological constellation. Similar to the civilian POES program, the DMSP program designs, launches, and maintains several near polar orbiting, sun synchronous satellites monitoring the meteorological, oceanographic, and solar-terrestrial physics environments. The visible and infrared sensors collect images of global cloud distribution across a 3,000-kilometer swath during both daytime and nighttime conditions.

Russian Federation Status Report

Status of METEOR polar orbiting meteorological systems

Two satellites of the METEOR-2 and -3 series are currently operated in circular orbit inclined at approximately 82°. These satellites are operating beyond their lifetime and their capabilities are limited. TV images of the MR-900 scanning instrument (resolution 2 km, swath width 2600 km, spectral band 0.5-0.7 μm) are directly disseminated from these satellites in APT mode (137 MHz) as well as from the RESURS-01 N4 satellite.

Satellite series and number	Launch date	APT radio signal characteristics			
		Carrier frequency (MHz)	Modulation	Allocated bandwidth (kHz)	Radio transmitter output power (W)
METEOR-2 N21	31/08/1991	137.30	FM	100	5
METEOR-3 N5	15/08/1991	137.85	FM	100	5
RESURS-01 N4	10/07/1998	137.75	FM	100	5

Meteorological payload on oceanographic satellites

Additional satellite information useful for meteorological and hydrological applications is provided by the Okean-01 N 7 (launched 11/10/94) and the Okean-O (launched 17/07/99) satellites. The core payload includes the side-looking radar RLSBO as well as an ensemble of tracking and scanning MW radiometer and multizonal scanning device of low resolution MSU-M. Besides high resolution data transmitted to Roshydromet Main Receiving Centers, low resolution

data are disseminated in APT format. The APT transmission includes one of four MSU-M channels or a frame of SLR, RM-08 and MSU-M channel 4 images of the same area. Characteristics of APT signal are the following: carrier frequency - 137.4 MHz; modulation - FM; allocated bandwidth - 100 kHz; radio transmitter output power: 5 W.

The Meteor-2 N 21, Meteor-3 N 5, Okean-01 N 7, Okean-O and Resurs-01 N 4 satellites orbital data needed for APT data direct readout are distributed via GTS in the «ORBIT» format. Dissemination schedules are placed on the SRC Planeta Internet server <http://sputnik.infospace.ru>.

Future Polar Orbiting Meteorological Satellite System METEOR-3M

The first polar orbiting meteorological satellite of Meteor-3M series is presently prepared for launch in the 4th quarter of 2000. The second satellite, Meteor-3M N 2, launch is planned in 2003.

The orbital parameters of these satellites are the following:

Satellite	Inclination, deg.	Altitude (km)	Period (min)	Ascending node equator crossing time
Meteor-3M N1	99.6°	1024	105.3	09:15
Meteor-3M N2	99.6°	1024	105.3	10:30 (16:30)

The payload of Meteor-3M N1 satellite includes scanning instruments of visible and IR range MR-2000M (similar to those on Meteor-3), KLIMAT-2 (modernized scanning IR radiometer KLIMAT installed on board Meteor-3). For imaging and sounding missions, Meteor-3M N 1 will carry the microwave (MW) scanning radiometer MIVZA (5 channels in the range 18-90 GHz). Sounding mission will be supported with MW radiometer MTVZA (20 channels in the range of 18.7-183.36 GHz). This instrument will provide data for atmospheric temperature and humidity soundings as well as for oceanographic researches such as microwave diagnostics of the active ocean layer processes.

New sensors for imaging and sounding mission are planned to be install onboard Meteor-3M N2. Those are: - multichannel scanning radiometer MSR (4 channels in visible and IR, similar to channels 1,2,4,5 of AVHRR, spatial resolution is close to 1 km).

The SAGE-III (USA, NASA) sensor is planned to be install onboard of Meteor-3M N1 satellite (in frame of the agreement between NASA and Rosaviakosmos). Both satellites of Meteor-3M series will allow standard 1.7 GHz downlink channel. HRPT mode is foreseen on Meteor-3M N2.

Geostationary satellites

NOAA/NESDIS Status Report

Geostationary Operational Environmental Satellites (GOES)

The current Geostationary Operational Environmental Satellites (GOES) are three-axis stabilized spacecraft in geosynchronous orbits. The current primary satellites, GOES-8 and GOES-10, are stationed over the east and west coasts of the United States. These satellites are used to provide simultaneous images and soundings of the Western Hemisphere.

The primary instrument payload for the current series of GOES spacecraft consists of the Imager, a multi-channel instrument designed to sense radiant and solar reflected energy and the Sounder, which provides data for atmospheric temperature and moisture profiles, surface and cloud top temperature and ozone distributions.

GOES-8

GOES-8, launched in April 1994, is stationed over the east coast of the United States at 75°W. The first of the series, GOES-8 retains the ability to provide the full range of products, although with some loss of redundancy of backup systems.

GOES-10

GOES-10 is the operational west coast satellite at 135°W. Shortly after launch in April 1997, GOES-10 suffered a near-fatal anomaly when it's solar array stopped moving, either due to a gear train jam or due to an external jam. The anomaly was studied over a period of months, and it was decided to invert the satellite (180° in relation to the Earth) and run the array drive in the reverse direction to track the sun. This operational strategy was coupled with extensive ground and spacecraft software modifications to allow the imagery to look "non-flipped" to the users.

GOES-11

The GOES-11 spacecraft was successfully launched on 3 May 2000 and will be used as the primary replacement in the event of a failed operational spacecraft. The GOES-11 orbit raising sequence was executed flawlessly and entered the operational mode on 14 May 2000. The first full disk visible image was taken on 18 May 2000. On August 14, 2000, GOES-11 was placed in a passive spin stabilized storage mode at 105° W. In the event that GOES-8 or GOES-10 should fail or run out of fuel, GOES-11 could be activated and be made operational within 48 hours.

GOES-9

Launched in May 1995, GOES-9 is now in a Z-axis Precession (ZAP) mode, a spin-stabilized storage mode that minimizes use of life-limited spacecraft components and requires little operator intervention. In the summer of 1998, GOES-9's momentum wheels started to show signs of significant lubrication starvation. GOES-9 was put into storage mode in anticipation of imminent wheel failure. Currently located at 105° W, GOES-9 can be called up to replace either GOES-8 or GOES-10 in the event of a spacecraft failure.

Future GOES System

GOES-M is scheduled to be available for a planned launch in the July, 2001 time frame. It has accommodations for a Solar X-ray Imager (SXI). The SXI instrument will stare at the Sun continuously and provide images in up to eight X-ray energy bands. Other instrumentation is similar to that on GOES-10. One important change is in the Imager channels. One channel at 12.0 μm will be replaced with one at 13.3 μm in order to better establish the height of winds for tropical storm predictions and for more accurate cloud optical properties. In addition, the horizontal resolution of the 6.7 μm water vapor channel will be improved from 8 km to 4 km.

GOES-N and GOES-O are in the hardware development and integration phase. The first set of Imager and Sounder instruments is scheduled for delivery in early 2001. The completed GOES-N spacecraft is scheduled to be available for launch in October 2002 and GOES-O in April 2004. Contractual options for GOES-P and GOES-Q are not yet exercised.

Initial planning for the series beginning with GOES-R is underway. Expectations are for satellites and instruments with seven year lifetimes rather that the current five year lifetimes, and a series of ABI and ABS instruments.

Ground Segment

RA III has 13 out of 13 Members equipped with low resolution polar-orbiting receivers (APT) but only 6 out of 13 Members equipped with high resolution polar-orbiting receivers (HRPT). Thirteen out of 13 Members were equipped with at least one polar-orbiting receiver, an increase of

one since 1995. Twelve out of 13 Members have low resolution WEFAX receivers while only 6 out of 13 Members have high resolution (HR) receivers. In all, 13 out of 13 Members have at least one geostationary receiver and the number has increased by one since 1995. In RA III, 13 out of 13 Members have at least one polar-orbiting receiver as well as one geostationary receiver. Therefore, 100% implementation has been achieved since 1995. RA III has achieved 100% of the WWW Implementation goal, which is the highest percentage amongst all Regions (reference: WMO Technical Document, SAT-25, Satellite Ground Receiving Equipment in WMO Regions, Status Report 2000 (WMO/TD No.1021).

Annex to paragraph 5.2.2

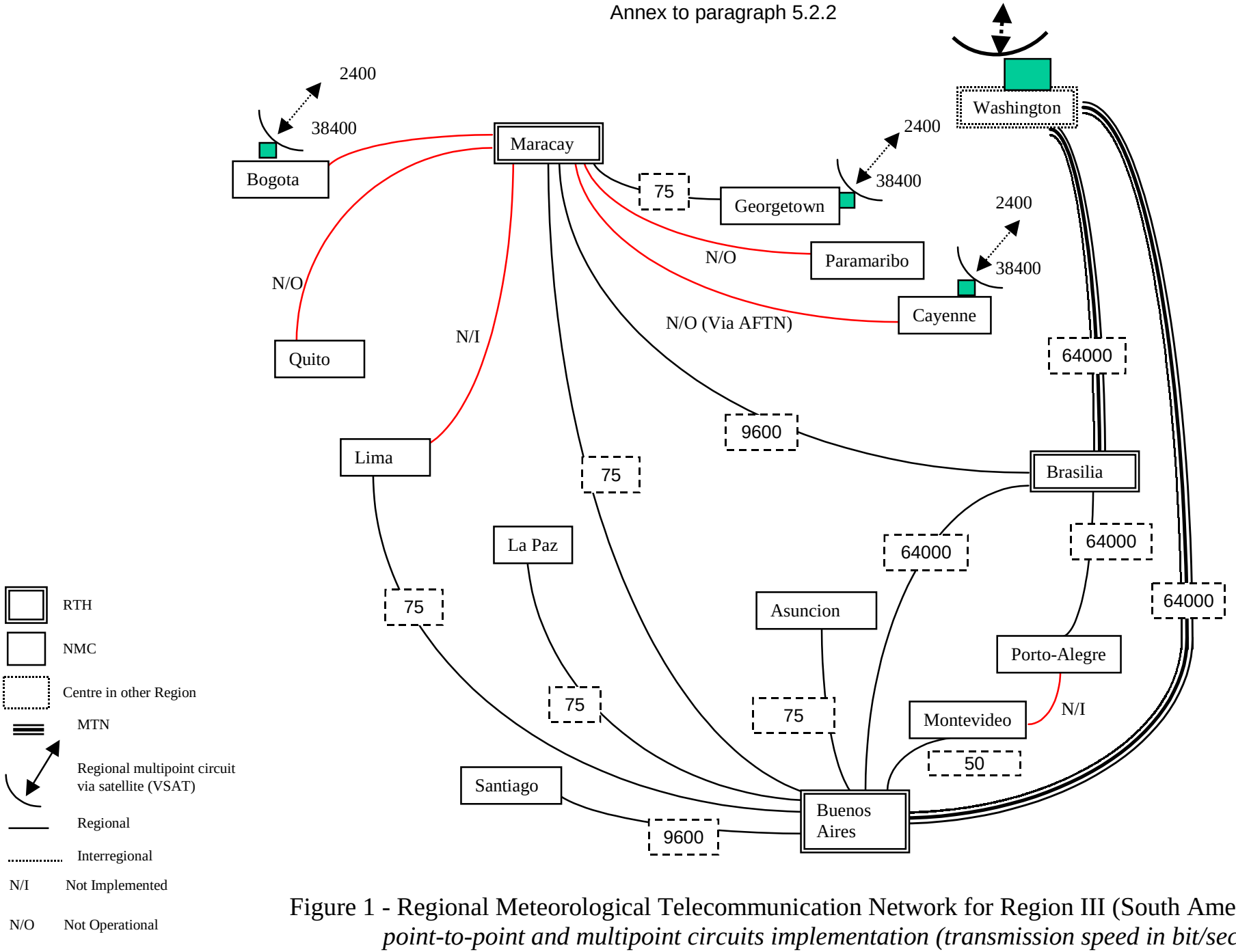

Figure 1 - Regional Meteorological Telecommunication Network for Region III (South America)
point-to-point and multipoint circuits implementation (transmission speed in bit/sec)

Summary description of the RA III RMDCN project

Introduction

The requirements for the RA III RMDCN and its technical specifications were developed by the RA III Steering Group, and endorsed by RA III Members. A brief description of some relevant technical and legal/administrative aspects is presented below.

Technical aspects

1. The RA III RMDCN will be a homogeneous network in which the selected provider will support a Managed Datacommunication Network Service (MDNS), consisting essentially of a data transport service. The supplier will provide:

- all circuits, hardware and software necessary for connectivity;
- the management of third parties, such as PTTs;
- the provision of help-desk facilities;
- the central management and supervision of all network functions;
- change management as required during the period of the contract;
- the provision of traffic statistics.

2. The main components of the network of the selected supplier are the backbone network, the customer premises equipment (CPE), the points-of-presence (PoP) in the countries served and the Local Access circuits which connect the CPE to the PoP, usually over a leased line provided by the national telephone supplier.

3. The backbone network is a private international network operated by the supplier and shared among many customers. The backbone will have a high capacity and be constructed to be resilient in the event of any failures of circuits or network equipment. Frame Relay networks are becoming very popular and cost-effective. To further enhance the availability of this network, the supplier will typically have at least two network control centres in different locations.

4. The CPE is the equipment, which the supplier provides to interface to the customer's equipment. The CPE would support, on the customer's side, connections to computers operated by the NMHS, including message switching systems and other applications.

5. The suppliers have one or more PoPs in the countries they serve. This enables customers to connect to the their network via a node in their own country, often in their own city.

General configuration

6. A typical connection of a GTS centre to the supplier's backbone network is indicated in the following figure.

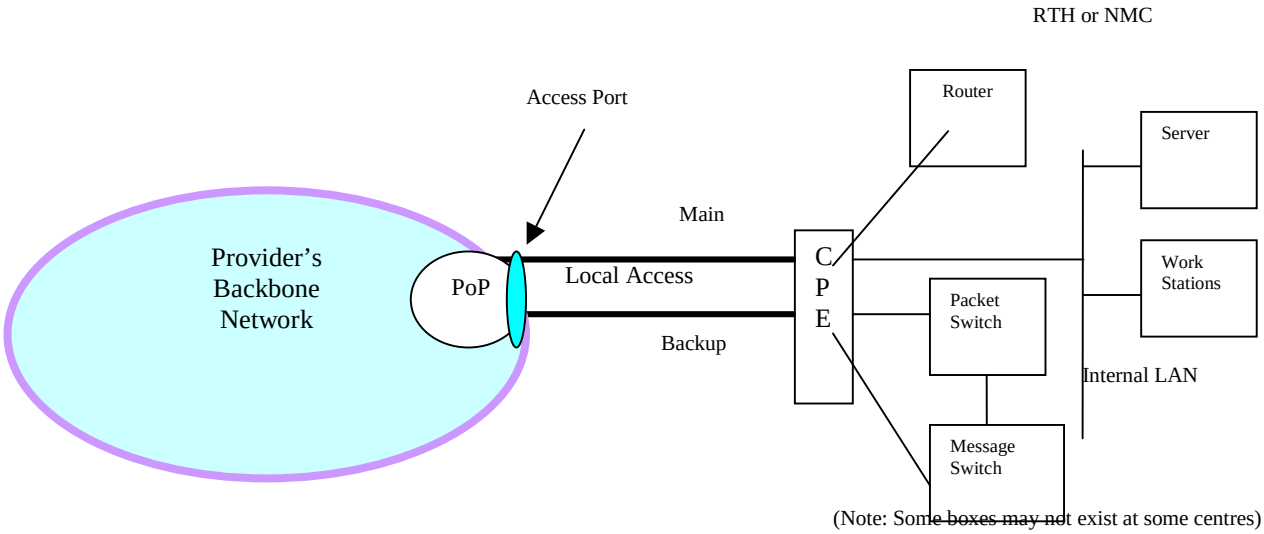

Figure 1 - Typical RMDCN connection at RTH/NMC

Legal and administrative aspects

7. There will be two types of contracts, namely:

(a) A Framework Contract to be concluded between the Secretary-General of WMO and the selected service provider, containing:
- service specifications and conditions for the RA III RMDCN;
- the provider's commitment to cover all RA III;
- the ceiling cost for access to the RMDCN by each RA III Member;
- the ceiling costs for additional services like higher bandwidth, service level, etc.;
- a specification of the guaranteed service level.
-

(b) An individual accession contract between a Member and the service provider, which should contain at least:
- bandwidth (e.g. Committed Information Rate) to be provided and other technical features;
- service level to be provided;
- payment modalities.

RA III RMDCN Project Management Framework

- The requirements for the RA III RMDCN and its technical specifications were developed by the RA III Steering Group, and endorsed by RA III Members.

- The WMO Secretariat would carry out the international tender upon request and on behalf of all RA III Members. Each RA III Member would be invited by the Secretary-General to state its willingness to join the RMDCN Framework Contract in the initial phase or later.

- A Project Management Committee would be established in the Secretariat, which would monitor and guide the project and prepare the necessary documents and proposals for approval by the Secretary-General as the project progresses.
- An independent consultant would be appointed to assist in the evaluation of bids and to manage the installation and acceptance activities. Required funds and organisational details to be identified.

- A Contract Advisory Committee (CAC), to be designated by the president of Regional Association III, would evaluate the proposals and advise on the selection of the best bid, with the following possible membership:

    - Representative of RTH Brasilia
    - Representative of RTH Buenos Aires
    - Representative of RTH Maracay
    - Two representatives of NMCs
    - The consultant

    The Contract Advisory Committee will operate under the confidentiality required for analysing commercial bids.

- The Secretary-General would sign the Framework Contract, which would define the technical solution, the level of services to be provided and the ceiling prices for RA III NMHSs, but not include any financial commitments for the WMO Secretariat or the Members. The Framework Contract provides an initial contractual framework for co-ordinating the establishment of national contracts.

- RA III Members committed to participate in the start-up phase would sign corresponding National Contracts, that include detailed specifications and costs, schedules for installation and acceptance tests. It is expected that at least seven Members would be willing to join in the first phase.

- Remaining Members would join the RMDCN Framework Contract under National Contracts as appropriate.

DRAFT RESOLUTION (XIII-RA III)

REGIONAL METEOROLOGICAL DATA COMMUNICATION NETWORK (RMDCN)

REGIONAL ASSOCIATION III (SOUTH AMERICA),

Noting:

(1) The requirements of RA III Members for reliable support of their operational meteorological and hydrological services;

(2) The existing deficiencies of the Regional Meteorological Telecommunication Network (RMTN) implementation in some parts of the Region;

(3) The high operating costs and limitations of the present implementation of the RMTN;

(4) The increasing demands on the RMTN for the exchange of more voluminous data sets and products between centres of the Region, in particular WMC and RSMCs products;

Further noting:

(1) That the RA III Steering Group on the RMDCN had completed the study phase of the RMDCN;

(2) That the Directors of RA III NMHSs endorsed the Specification of Requirements for the RMDCN developed by the Steering Group;

(3) That the Working Group on Internal Matters of RA III (Santiago, November 2000) endorsed the management framework for the development and implementation of the RA III RMDCN project;

Considering:

(1) That urgent action is needed to improve the RMTN in order to serve the needs of Members for data and products, and to eliminate existing deficiencies in the Region;

(2) That the technical preconditions are now available for establishing a RMDCN which offers to all Members in the Region the opportunity to reach a high level of performance;

(3) That co-operative efforts are needed to enable the further development and implementation of the new RMDCN project, and that some RA III Members may not be able to participate in the initial phase of the RMDCN;

Endorses the request from the president of RA III to the Secretary General to undertake the procurement process for the selection of a suitable provider of the RMDCN services.

Decides:

(1) To proceed with the implementation of the RMDCN in the Region, according to the agreed plan and project management framework, including:
   a. International Invitation to Tender for the RMDCN services;
   b. Selection of the most suitable services provider;

c. Establishment of the RMDCN Framework Contract to be signed by the Secretary-General on behalf of the Members of RA III;
d. Initial implementation phase, including establishment of RMDCN national contracts by RA III Members concerned;
e. Operational phase

(2) To re-establish the RA III RMDCN Steering Group, reporting to the president of the Association, to co-ordinate the RMDCN activities in collaboration with the WG-PIW, with the following terms of reference:

a. To carry out necessary studies concerning technical/administrative issues related to the RA III RMDCN project;
b. To co-ordinate the activities necessary to implement and operate the RMDCN;
c. To advise the president on actions to be taken in the framework of the project;

(3) That the Steering Group should be composed of the following core members:

One expert from each Member operating an RTH, i.e:

Argentina
Brazil
Venezuela

One expert from two Members operating an NMC, i.e.:

Chile
Colombia;

In addition the Steering Group may comprise experts from other Members willing to provide a major contribution.

(4) That the core membership of the Steering Group complemented by a data-communication consultant as appropriate, should act as the Contract Advisory Committee (CAC) to advise on the selection of RMDCN services provider;

(5) To designate, in accordance with Regulation 32 of the WMO General Regulations, ... (.....) as chairperson of the group;

Invites RA III Members to co-operate and assist in all possible ways and means with a view to facilitating the successful implementation of the RMDCN and the participation of all RA III Members in the new network as early as possible;

Requests the Secretary-General:

(1) To provide coordination and support to the RMDCN plan;

(2) To establish a co-ordinated cooperation project, including a Trust Fund, in the framework of the Technical Cooperation Programme of WMO with a view to supporting and facilitating the further development and implementation of the RMDCN project, including support to consultant services, meetings of the Steering Group and the CAC as necessary, and implementation at NMCs.

(3) To invite RA III Members and other Members as appropriate, to contribute to the co-ordinated cooperation project and Trust Fund for the RA III RMDCN.

Draft Resolution 1 (XIII-RA III)

Res. 1 (XIII-RA III) - WORKING GROUP ON PLANNING AND IMPLEMENTATION OF THE WWW IN REGION III

REGIONAL ASSOCIATION III (SOUTH AMERICA),

NOTING:

(1) Resolution 2 (Cg-XIII) - World Weather Watch Programme for 2000-2003,

(2) Resolutions 23 (Cg-XIII) - Fifth WMO Long-term Plan (2000-2009);

(3) Resolution 40 (Cg-XII) - WMO Policy and Practice for the Exchange of Meteorological and Related Data and Products Including Guidelines on Relationships in Commercial Meteorological Activities,

(4) The report of the chairman of the Working Group on Planning and Implementation of the WWW in RA III and its Rapporteurs;

(5) The necessity to involve the regional Working Group on Planning and Implementation of the WWW in the development and implementation of the Public Weather Services Programme,

CONSIDERING:

(1) That WWW data and products are of vital importance to Members in Region III for meeting the increasing requirements of users for meteorological services,

(2) That the implementation of the WWW in the Region should be kept under constant review,

(3) That the introduction of the new WWW concepts will be of great benefit to all Members in the Region,

(4) That full integration of the WWW functional components requires careful co-ordination among Members of RA III and constant evaluation of the related projects,

(5) That the WMO Long-term Plan needs regular updating from the point of view of regional requirements,

DECIDES:

(1) To re-establish the Working Group on the Planning and Implementation of the WWW in Region III with the following terms of reference:

(a) To monitor the implementation and operation of the WWW in the Region and advise on possible improvements and priorities and appropriate actions to be carried out under the WWW Programme and on the need for external support, where required;

(b) To keep under review the actions taken under the Fifth Long-term Plan with a view to updating and further developing the WWW Programme in RA III;

(c) To develop proposals for further development and full integration of the WWW components with a view to achieving a cost-effective operation of the WWW and better supply of data and products in the Region;

(d) To keep abreast of new developments, guidelines and decisions of the CBS and its working groups in the field of meteorological data processing, observing techniques, telecommunications, data management and applications of meteorological satellites and to make recommendations for their regional use;

(e) To identify and keep under review regional requirements for the exchange of observational data and products and to propose measures and procedures as appropriate to meet those needs for information from within and outside the Region;

(f) To advise the president of the Association on all matters concerning the WWW, and in particular on the annual work carried out by the respective rapporteurs;

(g) To keep under constant review regional operational practices, in particular the Regional Meteorological Telecommunication Plan and its implementation, including developments in the use of satellites for data collection and distribution;

(2) That the working group shall have the following composition:

(a) Core members:

Rapporteur on Regional Aspects of the Global Observing System;

Rapporteur on Regional Aspects of the Global Data-processing System;

Rapporteur on Regional Aspects of the Global Telecommunication System;

Rapporteur on Regional Aspects of Data Management and Codes;

Rapporteur on Regional Aspects of Public Weather Services.

(b) Experts to be nominated by Members who wish to participate actively in the work of the working group.

(3) To adopt the terms of reference of the rapporteurs that are given in the annex to this resolution;

(4) To designate, in accordance with Regulation 32 of the WMO General Regulation ..... as chairman of the working group and ..... as vice-chairman;

(5) To invite:

(a) ..... to serve as Rapporteur on Regional Aspects of the Global Observing System;

(b) ..... to serve as Rapporteur on Regional Aspects of the Global Data-processing System;

(c) ..... to serve as Rapporteur on Regional Aspects of the Global Telecommunication System;

(d) ..... to serve as Rapporteur on Regional Aspects of Data Management and Codes;

(e) ..... to serve as Rapporteur on Regional Aspects of Public Weather Services.

(6) To request the chairman of the working group to submit a progress reports to the president of the Association on 1 November of each year and a final report not later than six months before the fourteenth session of the Association.

Annex to Resolution 1 (XIII-RA III)

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

The terms of reference for the rapporteurs nominated under Resolution 1 (XIII-RA III) are as follows:

(a) The Rapporteur on Regional Aspects of the Global Observing System

(i) To keep abreast of developments in new observing systems, e.g. surface-based remote sensors and profilers, AMDAR, ASDAR, ASAP and drifting buoys;

(ii) To review and advise on the design and implementation of the Regional Basic Synoptic Network of surface and upper-air stations;

(iii) Follow up the operational experience of Members in the Region on the use of new observing systems and to formulate recommendations;

(iv) To identify the training requirements of Members in the Region for the successful implementation, operation and maintenance of the observing system;

(v) To advise the chairman of the working group in matters concerning the regional observing systems and new developments in observing techniques, including information on instruments and sensors in the operational systems;

(vi) To represent the Region at sessions of expert/Implementation teams of the CBS OPAG on Integrated Observing Systems, as required;

(vii) To submit an annual activity report to the chairperson of the Working Group on 1 September each year and a comprehensive report not later than 3 months before the scheduled meeting of the Working Group.

(b) The Rapporteur on Regional Aspects of the Global Data-processing System

(i) To keep abreast of developments in data-processing equipment and techniques which could be beneficially introduced at NMCs or RSMCs to improve their operational capability both within the WWW system and in related areas;

(ii) To formulate recommendations for co-ordinated implementation of data-processing facilities and techniques at GDPS, GTS and other centres and, if required, for multi-purpose use;

(iii) To identify the training requirements of Members in the Region for the successful implementation, operation and maintenance of the data-processing system;

(iv) To advise the chairman of the working group in all matters concerning data-processing activities;

(v) To represent the Region at sessions of expert/Implementation teams of the CBS OPAG on Data Processing and Forecasting System, as required;

(vi) To submit an annual activity report to the chairperson of the Working Group on 1 September each year and a comprehensive report not later than 3 months before the scheduled meeting of the Working Group.

(c) The Rapporteur on Regional Aspects of the Global Telecommunication System

(i) To keep abreast of developments in new telecommunication technology and equipment and to study their possible adaptation to the requirements for an efficient regional meteorological telecommunication system, as well as the opportunities to be derived from communication space techniques, using commercial and meteorological satellites;

(ii) To keep under review the regional meteorological telecommunication plan, particularly as regards the design and development of the proposed RMTN, based on the concept of a Valued Added Network (Managed Services Network);

(iii) To identify the training requirements of Members in the Region for the successful implementation, operation and maintenance of the Global Telecommunication System;

(iv) To advise the chairman of the working group in matters concerning the regional meteorological telecommunication system;

(v) To represent the Region at sessions of expert/Implementation teams of the CBS OPAG on Information Systems and Services, as required;

(vi) To submit an annual activity report to the chairperson of the Working Group on 1 September each year and a comprehensive report not later than 3 months before the scheduled meeting of the Working Group.

(d) The Rapporteur on Regional Aspects of WWW Data Management and Codes

(i) To keep under review data and product selection and presentation to recipients (NMCs) and to take action on regional coding problems;

(ii) To collect information on the level of quality control of data and products, and co-ordinated related activities;

(iii) To keep under review the WWW data and product recovery procedures in case of major outages of key facilities;

(iv) To co-ordinate both real-time and non-real-time monitoring of the integrated WWW system in the Region;

(v) To identify the training requirements of Members in the Region for the successful implementation of the WWW data management functions;

(vi) To advise the chairman of the working group in all matters concerning data management and meteorological codes in the Region;

(vii) To keep under review data and information presentation, including exchange formats and codes and conversion between formats and codes, including regional code practices;

(viii) To represent the Region at sessions of expert/Implementation teams of the CBS OPAG on Information Systems and Services, as required;

(ix) To submit an annual activity report to the chairperson of the Working Group on 1 September each year and a comprehensive report not later than 3 months before the scheduled meeting of the Working Group.

(e) The Rapporteur on Regional Aspects of Public Weather Service

(i) To keep under review the implementation of the Public Weather Services Programme in Region III;

(ii) To advise the chairman of the Working Group on matters relating to formulation, presentation and dissemination of forecasts and warnings and establishing good relations with the media and the private sector;

(iii) To keep under review education and training requirements related to the Public Weather Services programme;

(iv) To keep under review, in co-ordination with the Rapporteur on the Regional Aspects of the GDPS, aspects relating to exchange and co-ordination of hazardous weather information among neighbouring countries;

(v) To represent the Region at sessions of expert/implementation teams of the CBS OPAG on Public Weather Services, as required;

(vi) To submit an annual activity report to the chairperson of the Working Group on 1 September each year and a comprehensive report not later than 3 months before the scheduled meeting of the Working Group.