Manual on the Global Data-processing and Forecasting System

Volume II – Regional Aspects

World Meteorological Organization

WMO-No. 485

Weather • Climate • Water

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INTRODUCTION

1. The *Manual on the Global Data-processing System** is issued in accordance with a decision of Seventh Congress.

2. This *Manual* is designed:

   (*a*) To facilitate co-operation in data processing between Members;

   (*b*) To specify obligations of Members in the implementation of the W orld Weather Watch (WWW) Global Data-processing System (GDPS);

   (*c*) To ensure adequate uniformity and standardization in the practices and procedures employed in achieving (*a*) and (*b*) above.

3. The *Manual* consists of:

   (*a*) Volume I – Global Aspects, constituting Annex IV to the WMO *Technical Regulations*. It contains the standard and recommended practices for the WWW Global Data-processing System;

   (*b*) Volume II – Regional Aspects, containing the regional and national aspects of the WWW Global Data-processing System based on the practices and procedures adopted by the regional associations and by Members concerned as well as relevant decisions of Congress, the Executive Council and the Commission for Basic Systems.

4. The material contained in Volume II does not form part of the WMO *Technical Regulations* and is applicable only to the Members of the regional associations concerned. The words "shall" and "should" mentioned in this volume have their dictionary meanings and do not have the regulatory character mentioned in the general introduction to the WMO *Technical Regulations*.

5. To avoid duplication, as far as practicable, between the contents of the two volumes of the *Manual*, cross-references are made in Volume II to the relevant paragraphs in V olume I whenever the texts of the global and regional provisions are identical.

6. Volume II is divided into sections corresponding to the six Regions of the W orld Meteorological Organization, namely:

- Region I Africa;
- Region II Asia;
- Region III South America;
- Region IV North and Central America;
- Region V South-West Pacific;
- Region VI Europe;

each of which is divided into three parts:

– Part I: Real-time data processing – regional and national aspects;

– Part II: Non-real-time processing – regional and national aspects;

– Part III: Monitoring of the Global Data-processing System – regional and national aspects.

A section is also provided on data-processing activities and meteorological services in the Antarctic.

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* Following the recommendation of CBS-Ext.(02) and the decision of Fourteenth Congress, the Global Data-processing System (GDPS) is renamed Global Data-processing and Forecasting System (GDPFS).

REGION I (AFRICA)

PART I

REAL-TIME DATA PROCESSING – REGIONAL AND NATIONAL ASPECTS

1. MINIMUM STANDARDS FOR QUALITY CONTROL OF REAL-TIME DATA IN THE REGION

1.1 Regional standards for quality control

The existing minimum global standards are satisfactory for both observational and processed data. No regional standard is required.

NOTE: Minimum standards for quality control of data for real-time use in the GDPS are given in Volume I, Attachment II.1.

1.2 Agreements between Members for quality control

No agreement exists between Members for the quality control of real-time data in the Region.

1.3 Standards established nationally, not included in global or regional standards, and of interest to other Members

Standards established nationally are included in WMO Publication No. 9, Volume B – *Data processing*.

2. OBSERVATIONAL DATA REQUIREMENTS AND TIMES OF RECEIPT OF OBSERVATIONAL DATA FOR REGIONAL EXCHANGE IN THE REGION

NOTE: The global standard practices and procedures concerning requirements for observational data and times of receipt of observational data are laid down in Volume I, Part II, paragraphs 2.2 and 2.3.

2.1 Types of observational data required from within the Region

Types of observational data required from within the Region, as noted by the eighth session of Regional Association I, are obtained from:

(*a*) The regional basic synoptic network: the Regional Association has agreed (final report VIII-RA I, general summary, paragraph 4.1.2.2) to the following observing programme for surface and upper-air observations:

(i) All surface stations included in the regional basic synoptic network should make surface observations at the four main standard times of observation, i.e. 00, 06, 12 and 18 UTC, and at the four intermediate standard times of observation, i.e. 03, 09, 15 and 21 UTC. Any surface station that cannot carry out the full observational programme should give priority to the carrying out of the observations at the main standard times;

(ii) All upper-air stations included in the regional basic synoptic network should carry out radiosonde and radiowind observations reaching regularly* at least the 30 hPa level at 00 and 12 UTC, and radiowind observations reaching regularly* at least the 70 hPa level at 06 and 18 UTC. The carrying out of radiowind observations at 00 and 12 UTC should receive priority over radiowind observations at 06 and 18 UTC:

NOTE: Information on the state of implementation of the RA I regional basic synoptic network is given in WMO Publication No. 217.

(*b*) Mobile ships;

(*c*) Aircraft weather reports for synoptic purposes;

(*d*) Radar stations;

(*e*) Near-polar-orbiting meteorological satellites;

(*f*) Geostationary (environmental) meteorological satellites.

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* The expression "regularly" means that the levels indicated should be reached with a frequency of at least 90 per cent of the ascents.

2.2 Types of observational data required from outside the Region

2.2.1 *Data which are included in the global exchange programme*

Special requirements indicated by certain Members are as follows:

(*a*) Ethiopia:

(i) The surface synoptic data for 06 and 12 UTC from parts of Region II and Region VI;

(ii) All upper-air data for 00, 06, 12 and 18 UTC from the same area as above;

(*b*) Morocco:

(i) Vertical sounding data obtained by satellite;

(ii) AIREP data from Region III, Region IV and Region VI;

(*c*) Tanzania:

(i) SYNOP, TEMP, PILOT, SHIP and AIREP data from Region VI and the western part of Region II;

(ii) Near-polar-orbiting and geostationary meteorological satellite data from the same areas as above;

(*d*) Zambia:

(i) The surface data from the western part of Region II, southern part of Region VI and adjacent oceanic areas;

(ii) All upper-air data from the same area as above.

NOTE: The types of observational data for global exchange are listed in Volume I, Attachment II.2 of this *Manual* and in Volume I of the *Manual on the GTS*, Attachment I-3.

2.2.2 *Data which are not included in the global exchange programme*

NOTE: Stations for the regional exchange of SYNOP reports at the main standard times of observation are listed in Volume II of the *Manual on the GTS*, Attachment I-1.

2.3 Times of receipt of observational data

Requirements as described in Volume I of this *Manual*, Part II, Attachment II.3 are acceptable. No special requirements are indicated by the Members.

NOTE: Times of receipt of observational data for use in the GDPS are given in Volume I, Attachment II.3.

3. PICTORIAL REPRESENTATION OF INFORMATION – REGIONAL AND NATIONAL ASPECTS IN THE REGION

3.1 Scales and projections of meteorological charts

Special practices followed by certain Members are given below:

(*a*) Kenya:

(i) Scale 1 = 7 500 000, 1 = 15 000 000, 1 = 20 000 000 for the surface and 850 hPa level;

(ii) Scale 1 = 25 000 000, 1 = 30 000 000 for other levels;

(*b*) Morocco: Region I, Mercator projection;

(*c*) Tanzania:

(i) Mercator projection at 22.5° latitude, scale 1 = 15 000 000 for the surface;

(ii) Mercator projection at 22.5° latitude, scale 1 = 25 000 000 for the upper air.

NOTE: A selection of scales which should be used for weather charts in the GDPS is given in Volume I, Part II, paragraph 4.1.2.

3.2 Symbols for pictorial representation of data, analyses and forecasts on meteorological charts

NOTE: Symbols used for pictorial representation of data, analyses and forecasts, on meteorological charts are given in Volume I, Attachment II.4.

4. EXCHANGE OF PROCESSED PRODUCTS BETWEEN CENTRES – REGIONAL PRACTICES IN THE REGION

NOTE: The global standard and recommended practices and procedures concerning the programmes of output products, the transmission priorities and the responsibilities of Members for providing information on their real-time data-processing activities are laid down in Volume I, Part II, paragraphs 5.2, 5.3 and 5.4 respectively. Several lists dealing with WMC/RSMC output products are given in the attachments to paragraphs 5.2 and 5.3. Detailed information on the programmes for preparation of output products by WWW centres is given in WMO Publication No. 9, Volume B – *Data processing*.

4.1 Requirements for WMC and RSMC output products from outside the Region

The requirements are the same as those given in Attachments II.8 to II.12 of Volume I.

4.2 Requirements for WMC and RSMC output products from inside the Region

See paragraph 4.1 above.

4.3 Transmission priorities for WMC and RSMC output products exchanged on the regional segments of the GTS

Priority list of products in support of aviation to be exchanged within Region I:

First priority: Area Forecast System forecasts valid for 12, 18, 24 and 30 hours after (00 and 12 UTC). The W AFS data set comprises:

(*a*) Significant weather charts for the 150–400 hPa layer and up to 70 hPa where required for SST operations;

(*b*) Wind and temperature forecasts for flight levels 50 (850 hPa), 100 (700 hPa), 180 (500 hPa), 240 (400 hPa), 300 (300 hPa), 340 (250 hPa), 390 (200 hPa) and 450 (150 hPa);

Wind and temperature forecasts for flight levels 530 (100 hPa) and 600 (70 hPa) when and where required for SST operations;

(*c*) Tropopause height and maximum wind forecasts.

Second priority: Products from GDPS centres (beyond H + 30):

- Surface prognoses from the RSMCs/WMC;
- 850 hPa prognoses from the RSMCs/WMC;
- 700 hPa prognoses from the RSMCs/WMC;
- 500 hPa prognoses from the RSMCs/WMC;
- 250/200 hPa prognoses from the RSMCs/WMC;
- 100 hPa prognoses from the RSMCs/WMC.

Third priority: Analyses/other forecasts:

- Analyses and forecast products up to and including H + 30 from the RSMCs and WMCs.

Fourth priority: Other processed data.

4.4 WMC and RSMC output products which must be exchanged in pictorial form within the Region

(To be developed.)

4.5 WMC and RSMC output products which are to be exchanged within the Region using the FM 47-V GRID and/or FM 49-VII GRAF codes

(To be developed.)

PART II

NON-REAL-TIME DATA PROCESSING – REGIONAL AND NATIONAL ASPECTS

1. DATA TO BE STORED AT CENTRES (RSMCs AND NMCs) WITHIN THE REGION

NOTE: The general responsibilities for storage of data at RSMCs are given in Volume I, Part III, paragraph 2.1.2 and Attachment III.2.

1.1 Responsibilities for storage of observational and processed data at RSMCs within the Region

A few Members have suggested that there is a need to store more frequent meteorological data and satellite and sea-surface observations as well as processed data at the RSMCs within the Region. These data should be easily available to any NMC within the Region.

1.2 Special requirements for storage of observational and processed data at NMCs within the Region

Certain Members have provided statements as follows:

(*a*) Kenya: Global and regional data are stored at its NMC as analysed charts for ten years. After ten years they are available on microfilm. Other products are stored for one year;

(*b*) Tanzania: Analysis of the tropical belt, including:

- Satellite winds;
- Sea-surface temperature;
- 30-day prognosis SHS:
- Surface and upper-air charts;

(*c*) Zambia: Storage of charts and surface and upper-air data in numerical form is essential, since most of the data from RA I are not available for real-time use.

2. MINIMUM STANDARDS FOR QUALITY CONTROL OF NON-REAL-TIME DATA IN THE REGION

NOTE: Minimum standards for quality control of data for non-real-time use in the GDPS are given in Volume I, Attachment II.l.

2.1 Regional standards for quality control

The existing minimum global standards are satisfactor y for both observational and processed data. No regional standard is required.

2.2 Agreements between Members for quality control

No agreement exists between Members for quality control of non-real-time data in the Region.

2.3 Standards established nationally, not included in global or regional standards, and of interest to other Members

No national standard has been established in the Region.

3. CLASSIFICATION AND CATALOGUING OF STORED DATA IN THE REGION

NOTE: Volume I, Part III, paragraph 4 establishes recommended procedures for the classification and cataloguing of stored data.

3.1 Regional procedures for classifying and cataloguing data stored at RSMCs

No regional procedure has been established. It is recommended that suitable regional practices be established later.

3.2 Regional procedures for classifying and cataloguing data stored at NMCs

See paragraph 3.1 above.

4. MEDIA AND FORMATS FOR EXCHANGE OF STORED DATA IN THE REGION

NOTE: Volume I, Part III, paragraphs 5.1 and 5.2 give recommended media and formats for the exchange of stored data.

4.1 Media for exchanging stored data within the Region

The following media are recommended for use within the Region:

(*a*) Magnetic tape with 9 tracks, $^1/_2$ inch with 800 BPI and/or 1600 BPI;

(*b*) Standard paper tape with five or eight tracks, using international alphabets Nos. 2 and 5 respectively.

(To be developed)

4.2 Formats for exchanging stored data within the Region

(To be developed)

4.3 Responsibilities of Members for exchange of non-real-time data within the Region

(To be developed)

PART III

MONITORING OF THE GDPS – REGIONAL AND NATIONAL ASPECTS

NOTE: Volume I, Attachment II.14 contains the Plan for Monitoring the Operation of the WWW. In this plan general guidelines and priorities are given for both real-time and non-real-time-monitoring. Most of the items included in the monitoring programme are concerned with the quality of observations (see section 1 of Part I and section 2 of Part II above) and with telecommunications procedures. There are two items which can be considered as involving real-time data processing, namely:

(*a*) Adherence to regional coding procedures;

(*b*) Evaluation of processed information received at RSMCs and NMCs.

1. REGIONAL PROCEDURES FOR CARRYING OUT REAL-TIME MONITORING OF THE GDPS

1.1 Adherence to regional coding procedures

The following recommendations are made for use in the Region:

(*a*) Periodic automatic and manual checks should be undertaken by the centre;

(*b*) NMCs should be responsible for meteorological checking of information collected and should ensure adherence to regional coding procedures before insertion on the GTS;

(*c*) Monitoring should be carried out as specified in Volume I, Attachment II.14. In particular, the heading, the correct number of groups and the correct number of figures of all messages should be checked.

1.2 Evaluation of processed information received at RSMCs and NMCs

The following recommendations are made for use in the Region:

(*a*) Analysed charts should be checked by examining the correct positioning of the Lows and Highs and direction of the streamlines;

(*b*) Processed data should be reviewed or re-analysed prior to storage;

(*c*) Automated validation should be carried out and standard flags set on suspect data.

2. REGIONAL PROCEDURES FOR CARRYING OUT NON-REAL-TIME MONITORING OF THE GDPS

2.1 Evaluation of processed information prior to storage

See paragraph 1.2 above.

REGION II (ASIA)

PART I

REAL-TIME DATA PROCESSING – REGIONAL AND NATIONAL ASPECTS

1. MINIMUM STANDARDS FOR QUALITY CONTROL OF REAL-TIME DATA IN THE REGION

1.1 Regional standards for quality control

NOTE: Minimum standards for quality control of data for real-time use in the GDPS are given in Volume I, Attachment II.1.

1.2 Agreements between Members for quality control

Within the south-east Asian countries as well as within countries represented on the WMO/ESCAP Panel on Tropical Cyclones, an interim basis real-time quality control of data in the Region is being established.

1.3 Standards established nationally, not included in global or regional standards, and of interest to other Members

None.

2. OBSERVATIONAL DATA REQUIREMENTS AND TIMES OF RECEIPT OF OBSERVATIONAL DATA FOR REGIONAL EXCHANGE IN THE REGION

NOTE: The global standard practices and procedures concerning requirements for observational data and times of receipt of observational data are laid down in Volume I, Part II, paragraphs 2.2 and 2.3.

2.1 Types of observational data required from within the Region

Types of observational data required from within the Region are obtained from:

(*a*) The regional basic synoptic network (including principal land stations and automatic weather stations): the Regional Association has agreed (final report VI-RA II, general summary, paragraph 4.1.2.4) to the following observing programme for surface and upper-air observations:

(i) All surface stations included in the regional basic synoptic network should make surface observations at the four main standard times of observation, i.e. 00, 06, 12 and 18 UTC, and at the four intermediate standard times of observation, i.e. 03, 09, 15 and 21 UTC. Any surface station that cannot carry out the full observational programme should give priority to the carrying out of the observations at the main standard times;

(ii) All radiowind stations of the regional basic synoptic network should attempt to make and disseminate upper-wind observations which reach the 70 hPa level as appropriate;

(iii) During the cyclone season, the radiowind stations which are in the field of a tropical cyclone should attempt to make upper-wind observations to as high a level as possible at 06 and 18 UTC and disseminate them. These observations should reach the 70 hPa level as appropriate. The carrying out of radiowind observations at 00 and 12 UTC should receive priority over radiowind observations at 06 and 18 UTC;

(iv) All radiosonde stations of the regional basic synoptic network should make observations of pressure, temperature and humidity up to as high a level as possible at 00 and 12 UTC and disseminate them. These observations should reach the 70 hPa level as appropriate;

(*b*) Fixed ocean stations;

(*c*) Selected supplementary and auxiliary ships;

(*d*) Aircraft;

(*e*) Weather radar;

(*f*) Near-polar-orbiting meteorological satellites;

(*g*) Geostationary (environmental) meteorological satellites;

(*h*) Direct read-out stations.

2.2 Types of observational data required from outside the Region

2.2.1 *Data which are included in the global exchange programme*

NOTE: The types of observational data for global exchange are listed in Volume I, Attachment II.2, of this *Manual* and in Volume I of the *Manual on the GTS*, Attachment I-3.

2.2.2 *Data which are not included in the global exchange programme*

NOTE: Stations for the regional exchange of SYNOP reports at the main standard times of observation are listed in Volume II of the *Manual on the GTS*, Attachment II-1.

2.3 Times of receipt of observational data

NOTE: Times of receipt of observational data for use in the GDPS are given in Volume I, Attachment II.3.

3. PICTORIAL REPRESENTATION OF INFORMATION – REGIONAL AND NATIONAL ASPECTS IN THE REGION

3.1 Scales and projections of meteorological charts

Special practices followed by certain Members are given below:

India: Mercator projection, 1:20 000 000 true at latitude 22.5 degrees

The above scale is as per GDPS standard given in Volume I, Part II, paragraph 4.1.2.

NOTE: A selection of scales which should be used for weather charts in the GDPS is given in Volume I, Part II, paragraph 4.1.2.

3.2 Symbols for pictorial representation of data, analyses and forecasts on meteorological charts

Special practices followed by certain Members are given below:

China: Wind speed is represented by a barb, the full barb representing 4 m s^{1} or 8 knots, the half-barb 2 m s^{1} or 4 knots;

Japan: The direction of swell, specified in Attachment II.4 to Volume I as an arrow with a wavy shaft, is represented as a straight arrow because of programming for automatic plotting.

NOTE: Symbols used for pictorial representation of data, analyses and forecasts on meteorological charts are given in Volume I, Attachment II.4.

4. EXCHANGE OF PROCESSED PRODUCTS BETWEEN CENTRES – REGIONAL PRACTICES IN THE REGION

NOTE: The global standard and recommended practices and procedures concerning the programmes of output products, the transmission priorities and the responsibilities of Members for providing information on their real-time data-processing activities are laid down in Volume I, Part II, paragraphs 5.2, 5.3 and 5.4 respectively. Several lists dealing with WMC/RSMC output products are given in the attachments to paragraphs 5.2 and 5.3. Detailed information on the programmes for preparation of output products by WWW centres is given in WMO Publication No. 9, Volume B – *Data processing*.

4.1 Requirements for WMC and RSMC output products from outside the Region

(To be completed later.)

4.2 Requirements for WMC and RSMC output products from inside the Region

The requirements are the same as those given in Attachments II.8 to II.12 of Volume I.

4.3 Transmission priorities for WMC and RSMC output products exchanged on the regional segments of the GTS

A list of minimum requirements for various types of output products from WMCs and RSMCs to be exchanged on the GTS is given in the attachment to this paragraph.

4.4 WMC and RSMC output products which must be exchanged in pictorial form within the Region

(To be developed.)

4.5 WMC and RSMC output products which are to be exchanged within the Region using the FM 47-V GRID and/or FM 49-VII GRAF codes

(To be developed.)

PART II

NON-REAL-TIME DATA PROCESSING – REGIONAL AND NATIONAL ASPECTS

1. DATA TO BE STORED AT CENTRES (RSMCs AND NMCs) WITHIN THE REGION

NOTE: The general responsibilities for storage of data at RSMCs are given in Volume I, Part III, paragraph 2.1.2 and Attachment III.2.

1.1 Responsibilities for storage of observational and processed data at RSMCs within the Region

(*a*) Members are responsible for collection for storage and dissemination the basic obser vational data received through the GTS and/or otherwise, for their area of responsibility:

RSMC Beijing: Area of responsibility of RTH Beijing for the collection of observational data;

RSMC Jeddah: Area of responsibility of RTH Jeddah for the collection of observational data;

RSMC Novosibirsk: Area of responsibility of RTH Novosibirsk for the collection of observational data;

RSMC New Delhi: Area of responsibility of RTH New Delhi for the collection of observational data;

RSMC Tashkent: Area of responsibility of RTH Tashkent and RTH Tehran for the collection of observational data;

RSMC Tokyo: Area of responsibility of RTH Tokyo and RTH Bangkok for the collection of observational data;

RSMC Khabarovsk: Area of responsibility of RTH Khabarovsk for the collection of observational data.

(The functions of RSMC Novosibirsk and RSMC Khabarovsk for the collection, storage and dissemination of TEMP data are undertaken by RSMC Tashkent.)

(*b*) Basic SYNOP and TEMP data should be stored on magnetic tapes;

(*c*) Analysed products should be stored on cards, magnetic tapes or microfilm;

(*d*) Observational data should be stored permanently and processed data for at least five years.

1.2 Special requirements for storage of observational and processed data at NMCs within the Region

(*a*) See remarks under paragraph 1.1 (*b*) – (*d*);

(*b*) The functions of RSMC Novosibirsk, RSMC Tashkent and RSMC Khabarovsk for the storage and dissemination of basic observational data are also undertaken by WDC Obninsk.

2. MINIMUM STANDARDS FOR QUALITY CONTROL OF NON-REAL-TIME DATA IN THE REGION

NOTE: Minimum standards for quality control of data for non-real-time use in the GDPS are given in Volume I, Attachment II.l.

2.1 Regional standards for quality control

Regional standards for quality control of non-real-time data are as specified in Volume I, Attachment II.1.

2.2 Agreements between Members for quality control

There are no agreements between Members for quality control in the Region.

2.3 Standards established nationally, not included in global or regional standards, and of interest to other Members

There are no national standards.

3. CLASSIFICATION AND CATALOGUING OF STORED DATA IN THE REGION

NOTE: Volume I, Part III, paragraph 4 establishes recommended procedures for the classification and cataloguing of stored data.

3.1 Regional procedures for classifying and cataloguing data stored at RSMCs

(*a*) No regional procedures exist. It is recommended that stored data be classified into two categories, namely:

(i) Basic surface and upper-air data;

(ii) Analysed data in the form of surface and upper-air charts;

(*b*) A catalogue should be maintained at one or more centres in Region II.

3.2 Regional procedures for classifying and cataloguing data stored at NMCs

See remark under paragraph 3.1.

4. MEDIA AND FORMATS FOR EXCHANGE OF STORED DATA IN THE REGION

NOTE: Volume I, Part III, paragraphs 5.1 and 5.2 give recommended media and formats for the exchange of stored data.

4.1 Media for exchanging stored data within the Region

For the exchange of data in the Region, magnetic tape with nine tracks, $^1/_2$ inch in width, with 800, 1600 or 6250 BPI is recommended.

4.2 Formats for exchanging stored data within the Region

For exchanging data in the Region, the standard WMO formats set out in Publication No. 469 should preferably be used.

4.3 Responsibilities of Members for exchange of non-real-time data within the Region

(*a*) Each Member should meet the requirements of other Members as regards making available non-real-time data stored in its national Service;

(*b*) Each Member should make available to the Secretariat information concerning the data in its national Service.

PART III

MONITORING OF THE GDPS – REGIONAL AND NATIONAL ASPECTS

NOTE: Volume I, Attachment II.14 contains the Plan for Monitoring the Operation of the WWW . In this plan general guidelines and priorities are given for both real-time and non-real-time-monitoring. Most of the items included in the monitoring programme are concerned with the quality of observations (see section 1 of Part I and section 2 of Part II above) and with telecommunications procedures. There are two items which can be considered as involving real-time data processing, namely:

(*a*) Adherence to regional coding procedures;

(*b*) Evaluation of processed information received at RSMCs and NMCs.

1. REGIONAL PROCEDURES FOR CARRYING OUT REAL-TIME MONITORING OF THE GDPS

1.1 Adherence to regional coding procedures

(To be included later.)

1.2 Evaluation of processed information received at RSMCs and NMCs

(To be developed after CBS, in consultation with CAS, has elaborated verification procedures for use in the GDPS.)

2. REGIONAL PROCEDURES FOR CARRYING OUT NON-REAL-TIME MONITORING OF THE GDPS

2.1 Evaluation of processed information prior to storage

See paragraph 1.2 above.

ATTACHMENT

MINIMUM REQUIREMENTS FOR VARIOUS TYPES OF OUTPUT PRODUCTS FROM WMCs AND RSMCs TO BE EXCHANGED ON THE GTS

(*Ref. Part I, paragraph 4.3*)

First priority:

1. Area Forecast System charts, issued four times daily in accordance with the appropriate ICAO regional air navigation plan, to include:

(*a*) Surface and significant weather 400–150 hPa (in one chart);

(*b*) At least two charts selected from the following:

(i) 300 hPa, 250 hPa, 200 hPa;

(ii) Tropopause/maximum wind;

(iii) Tropopause/vertical wind shear;

(*c*) 100 hPa and appropriate significant weather information as and when required for scheduled SST operations.

2. Area Forecast System charts to serve international general aviation operations up to FL 200 in accordance with the appropriate ICAO regional air navigation plan, to include:

(*a*) Surface

(*b*) Significant weather;

(*c*) 850 and/or 700 and/or 500 hPa.

3. Other products:

(*a*) 850 hPa;

(*b*) Winds and temperatures up to FL 250.

Second priority:

Products from RSMCs inside the Region: surface, 500 hPa and 250 hPa 24-hour prognoses.

Third priority:

Products from RSMCs outside the Region: 500 hPa and 300 hPa analyses from RSMC Melbourne for Area "B".

Fourth priority:

Products from WMCs: Surface and 500 hPa: analyses and 48- and 72-hour prognoses.

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REGION III (SOUTH AMERICA)

PART I

REAL-TIME DATA PROCESSING – REGIONAL AND NATIONAL ASPECTS

1. MINIMUM STANDARDS FOR QUALITY CONTROL OF REAL-TIME DATA IN THE REGION

1.1 Regional standards for quality control

The existing minimum global standards are satisfactory for both observational and processed data. No regional standard is required.

NOTE: Minimum standards for quality control of data for real-time use in the GDPS are given Volume I, Attachment II.1.

1.2 Agreements between Members for quality control

No agreement exists between Members for quality control of real-time data in the Region.

1.3 Standards established nationally, not included in global or regional standards, and of interest to other Members

No national standard of interest to other Members.

2. OBSERVATIONAL DATA REQUIREMENTS AND TIMES OF RECEIPT OF OBSERVATIONAL DATA FOR REGIONAL EXCHANGE IN THE REGION

NOTE: The global standard practices and procedures concerning requirements for observational data and times of receipt of observational data are laid down in Volume I, Part II, paragraphs 2.2 and 2.3.

2.1 Types of observational data required from within the Region

Types of observational data required from within the Region, as noted by the eighth session of Regional Association III, are obtained from:

(*a*) Regional basic synoptic network: the Regional Association has agreed (final report VIII-RA III, general summary, paragraph 4.1.3.2) to the following observing programme for surface and upper-air observations:

(i) All surface stations included in the regional basic synoptic network should make surface observations at the four main standard times of observation, i.e. 00, 06, 12 and 18 UTC, and at the four intermediate standard times of observation, i.e. 03, 09, 15 and 21 UTC. The carrying out of the observations at the main standard time should be given first priority;

(ii) All upper-air stations included in the regional basic synoptic network should carry out radiosonde and/or radiowind observations at 00 and 12 UTC. The stations which are unable to carry out the full upper-air observing programme should give priority to making observations at 12 UTC:

(iii) The upper-air stations marked with an asterisk should carry out radiosonde and radiowind observations up to at least the 10 hPa level and should be prepared to repeat soundings which do not reach the 200 hPa level in favourable weather conditions;

(*b*) Voluntary Observing Ships;

(*c*) Aircraft weather reports;

(*d*) Radar stations;

(*e*) Near-polar-orbiting meteorological satellites;

(*f*) Geostationary meteorological satellites;

(*g*) Automatic land station.

2.2 Types of observational data required from outside the Region

2.2.1 *Data which are included in the global exchange programme*

Special requirements indicated by certain Members are as follows:

(*a*) Argentina:

(i) The surface synoptic data over ocean area of octants 5 and 6:

(ii) Southern hemisphere surface synoptic data. See Volume I, Attachment II-2, (*g*) and (*h*);

(*b*) Guyana:

(i) The oceans adjacent to the north, east and west coasts of South America:

(ii) Tropical zones, especially Region I, Blocks 60, 61 and 65 west of 5°W. See Volume I, Attachment II.2, 1 (*a*) to (*k*).

NOTE: The types of observational data for global exchange are listed in Volume I, Attachment II.2 and Volume I of the *Manual on the GTS,* Attachment I-3.

2.2.2 *Data which are not included in the global exchange programme*

NOTE: Stations for the regional exchange of SYNOP reports at the main standard times of observation are listed in Volume II of the *Manual on the GTS*, Attachment III-1.

2.3 Times of receipt of observational data

Requirements as described in Volume I, Attachment II.3 of this *Manual* are acceptable. No special requirements are indicated by the Members.

NOTE: Times of receipt of observational data for use in the GDPS are given in Volume I, Attachment II.3.

3. PICTORIAL REPRESENTATION OF INFORMATION – REGIONAL AND NATIONAL ASPECTS IN THE REGION

3.1 Scales and projections of meteorological charts

Special practices followed by certain Members are given below:

(*a*) Colombia: Part of hemisphere, Mercator projection, scale 1 = 20 000 000;

(*b*) Guyana: 5°W to 105°W longitude and 44°N to 23°S latitude, Mercator projection at $22^1/_2$°N and $22^1/_2$°S, scale 1 = 12 500 000 for surface analysis, scale 1 = 25 000 000 for upper-air analysis.

NOTE: A selection of scales which should be used for weather charts in the GDPS is given in Volume I, Part II, paragraph 4.1.2.

3.2 Symbols for pictorial representation of data, analyses and forecasts on meteorological charts

Guyana uses the following special symbol in plotting: in the regional code (Section 3) in the group $56D_LD_MD_H$ small arrows indicating the direction of cloud drift (Code table 0700) can be plotted to the left or immediately above the cloud symbols.

NOTE: Symbols used for pictorial representation of data, analyses and forecasts on meteorological charts are given in Volume I, Attachment II.4.

4. EXCHANGE OF PROCESSED PRODUCTS BETWEEN CENTRES – REGIONAL PRACTICES IN THE REGION

NOTE: The global standard and recommended practices and procedures concerning the programmes of output products, the transmission priorities and the responsibilities of Members for providing information on their real-time data-processing activities are laid down in Volume I, Part II, paragraphs 5.2, 5.3 and 5.4 respectively. Several lists dealing with WMC/RSMC output products are given in the attachments to paragraphs 5.2 and 5.3. Detailed information on the programmes for preparation of output products by WWW centres is given in WMO Publication No. 9, Volume B – *Data processing*.

4.1 Requirements for WMC and RSMC output products from outside the Region

The requirements are the same as those given in Attachments II.8 to II.12 of Volume I.

4.2 Requirements for WMC and RSMC output products from inside the Region

The requirements are the same as those given in Attachments II.8 to II.12 of Volume I.

4.3 **Transmission priorities for WMC and RSMC output products exchanged on the regional segments of the GTS**

Priority list of products in support of aviation to be exchanged within Region III:

First priority: Area Forecast System forecasts valid for 12, 18, 24 and 30 hours after (00 and 12 UTC). The W AFS data set comprises:

(*a*) Significant weather charts for the 150–400 hPa layer and up to 70 hPa where required for SST operations;

(*b*) Wind and temperature forecasts for flight levels 50 (850 hPa), 100 (700 hPa), 180 (500 hPa), 240 (400 hPa), 300 (300 hPa), 340 (250 hPa), 390 (200 hPa) and 450 (150 hPa);

Wind and temperature forecasts for flight levels 530 (100 hPa) and 600 (70 hPa) when and where required for SST operations;

(c) Tropopause height and maximum wind forecasts;

Second priority: Products from GDPS centres (beyond H + 30):

- Surface prognoses from the RSMCs/WMC;
- 850 hPa prognoses from the RSMCs/WMC;
- 700 hPa prognoses from the RSMCs/WMC;
- 500 hPa prognoses from the RSMCs/WMC;
- 300/250/200 hPa prognoses from the RSMCs/WMC;
- 100 hPa prognoses from the RSMCs/WMCs;

Third priority: Analyses/other forecasts:

- Analyses and forecast products up to and including H + 30 from the RSMCs and WMCs;

Fourth priority: Other processed data.

4.4 **WMC and RSMC output products which must be exchanged in pictorial form within the Region**

Satellite products are required covering South America and surrounding oceans, namely:

(*a*) Cloud coverage;

(*b*) Sea-surface temperatures.

Specification of other requirements to be developed.

4.5 **WMC and RSMC output products which are to be exchanged within the Region using the FM 47-V GRID and/or FM 49-VII GRAF codes**

(To be developed.)

PART II

NON-REAL-TIME DATA PROCESSING – REGIONAL AND NATIONAL ASPECTS

1. **DATA TO BE STORED AT CENTRES (RSMCs AND NMCs) WITHIN THE REGION**

NOTE: The general responsibilities for storage of data at RSMCs are given in Volume I, Part III, paragraph 2.1.2 and Attachment III.2.

1.1 **Responsibilities for storage of observational and processed data at RSMCs within the Region**

(To be developed.)

1.2 Special requirements for storage of observational and processed data at NMCs within the Region

Suriname needs to store more detailed weather facsimile charts and sea-surface temperature analysis maps of the tropical Atlantic region.

2. MINIMUM STANDARDS FOR QUALITY CONTROL OF NON-REAL-TIME DATA IN THE REGION

NOTE: Minimum standards for quality control of data for non-real-time use in the GDPS are given in Volume I, Attachment II.l.

2.1 Regional standards for quality control

The existing minimum global standards are satisfactory for both observational and processed data.

2.2 Agreements between Members for quality control

No agreement exists between Members for quality control of non-real-time data in the Region.

3. CLASSIFICATION AND CATALOGUING OF STORED DATA IN THE REGION

NOTE: Volume I, Part III, paragraph 4 establishes recommended procedures for the classification and cataloguing of stored data.

3.1 Regional procedures for classifying and cataloguing data stored at RSMCs

No regional procedure has been established.

3.2 Regional procedures for classifying and cataloguing data stored at NMCs

No regional procedure has been established.

4. MEDIA AND FORMATS FOR EXCHANGE OF STORED DATA IN THE REGION

NOTE: Volume I, Part III, paragraphs 5.1 and 5.2 give recommended media and formats for the exchange of stored data.

4.1 Media for exchanging stored data within the Region.

The following media are laid down for use within the Region:

(*a*) Magnetic tape with 9 tracks, $^1/_2$ inch and 800 BPI or 1600 BPI;

(*b*) Standard paper tape with five or eight tracks, using international alphabets Nos. 2 and 5 respectively.

4.2 Formats for exchanging stored data within the Region

(To be developed.)

4.3 Responsibilities of Members for exchange of non-real-time data within the Region

(To be developed.)

PART III

MONITORING OF THE GDPS – REGIONAL AND NATIONAL ASPECTS

NOTE: Volume I, Attachment II.14 contains the Plan for Monitoring the Operation of the WWW . In this plan general guidelines and priorities are given for both real-time and non-real-time monitoring. Most of the items included in the monitoring programme are concerned with the quality of observations (see section 1 of Part I and section 2 of Part II above) and with telecommunications procedures. In addition real-time monitoring is required as regards:

(*a*) Adherence to regional coding procedures;

(*b*) Evaluation of processed information received at RSMCs and NMCs.

1. REGIONAL PROCEDURES FOR CARRYING OUT REAL-TIME MONITORING OF THE GDPS

1.1 Adherence to regional coding procedures

(*a*) Periodic automatic and manual checks should be undertaken by the centre;

(*b*) NMCs should be responsible for meteorological checking of information collected and should ensure adherence to regional coding procedures before insertion on the GTS;

(*c*) Monitoring should be carried out as specified in V olume I, Attachment II-14. In particular, the heading, the correct number of groups and the correct number of figures of all messages should be checked.

1.2 EVALUATION OF PROCESSED INFORMATION RECEIVED AT RSMCs AND NMCs

(To be developed.)

2. REGIONAL PROCEDURES FOR CARRYING OUT NON-REAL-TIME MONITORING OF THE GDPS

2.1 Evaluation of processed information prior to storage

(To be developed.)

REGION IV (NORTH AND CENTRAL AMERICA)

PART I

REAL-TIME DATA PROCESSING – REGIONAL AND NATIONAL ASPECTS

1. MINIMUM STANDARDS FOR QUALITY CONTROL OF REAL-TIME DATA IN THE REGION

1.1 Regional standards for quality control

NOTE: Minimum standards for quality control of data for real-time use in the GDPS are given in Volume I, Attachment II.1.

1.2 Agreements between Members for quality control

NOTE: The USA issues routine teletype notifications of discrepancies in SYNOP, TEMP and PILOT data in real time to several Member countries.

1.3 Standards established nationally, not included in global or regional standards, and of interest to other Members

USA: Programming completed for the following automated/interactive real-time quality control:

(*a*) Bulletin formatting and correctness;

(*b*) Garbled reports;

(*c*) Inter-parameter compatibilities;

(*d*) Gross errors;

(*e*) Space compatibility;

(*f*) Hydrostatic and vertical consistency (TEMP/PILOT);

(*g*) Diurnal temperature variation (surface);

(*h*) Specific validation of air temperature, dew points, extreme temperatures, past/present weather and precipitation amounts.

Canada: Main effort has been toward error prevention rather than error correction. All RAOB/RA WIN reports are made by automated systems, thus eliminating human (although not instrumental) errors. Transmission is by 8-channel self-correcting teletype. All Canadian SYNOPs are checked automatically for 180 possible errors and the originating station is informed in real time. The terminal on which SYNOPs are entered makes a first-level verification and informs the operator of any need for checking. As well, the communications switching computer performs additional checks and can request operator regeneration. Temporal and spatial verification and correction are not yet possible before transmission to the GTS.

Bahamas: All national traffic is plotted, checked by a meteorologist for temporal and spatial consistency and corrected, when necessary, before onward transmission.

2. OBSERVATIONAL DATA REQUIREMENTS AND TIMES OF RECEIPT OF OBSERVATIONAL DATA FOR REGIONAL EXCHANGE IN THE REGION

NOTE: The global standard practices and procedures concerning requirements for observational data and times of receipt of observational data are laid down in Volume I, Part II, paragraphs 2.2 and 2.3.

2.1 Types of observational data required from within the Region

Types of observational data required from within the Region are obtained from:

(*a*) The regional basic synoptic network;

(*b*) Mobile ship stations;

(*c*) Automatic marine stations;

(*d*) Aircraft weather reports;

(*e*) Automatic meteorological data aircraft reporting (ASDAR);

(*f*) Ground weather radars;

(*g*) Near-polar-orbiting meteorological satellites;

(*h*) Geostationary (environmental) meteorological satellites.

NOTES: (l) The Regional Association has agreed to the following observing programme for surface and upper-air observations:

(*a*) All surface stations in the regional basic synoptic network should make surface synoptic obser vations at the four main standard times of observation, i.e. 00, 06, 12 and 18 UTC, and at the four intermediate standard times of observation, i.e. 03, 09, 15 and 21 UTC. The carrying out of the observations at the main standard times should be given first priority;

(*b*) All upper-air stations in the regional basic synoptic network should carry out radiosonde and rawinsonde observations up to the 10 hPa level at 00 and 12 UTC. The stations which are unable to carr y out the full observing programme should give priority to the carrying out of the observations at 12 UTC.

(2) In addition to the data types specified in Volume I, Part II, paragraph 2.2, most Members require:

(*a*) SI for all surface stations;

(*b*) SN, METAR or "hourly (SA)" for all surface stations;

(*c*) PILOT Parts B and D for all capable stations;

(*d*) HYDRA for all capable stations.

2.2 Types of observational data required from outside the Region

2.2.1 *Data which are included in the global exchange programme*

NOTE: The types of observational data for global exchange are listed in V olume I, Attachment II.2 of this *Manual* and in Volume I of the *Manual on the GTS,* Attachment I-3.

2.2.2 *Data which are not included in the global exchange programme*

NOTE: Stations for the regional exchange of SYNOP reports at the main standard times of observation are listed in Volume II of the *Manual on the GTS,* Attachment IV-1.

2.3 Times of receipt of observational data

NOTES: (1) Times of receipt of observational data for use in the GDPS are given in Volume I, Attachment II.3.

(2) To ensure the timely and efficient operation of the regional telecommunication and data-processing systems, SM, SI, SN, METAR and SHIP reports from within the Region should be received at WMC Washington within 15 minutes of the observing station filing time. Parts A and B of TEMP and PILOT reports are required at H+l hour and Parts C and D at H+2 hours.

3. PICTORIAL REPRESENTATION OF INFORMATION – REGIONAL AND NATIONAL ASPECTS IN THE REGION

3.1 Scales and projections of meteorological charts

Scales for weather charts are as given in V olume I, Part II, paragraph 4.1.2. Mer cator projection is used for tropical regions and polar stereographic elsewhere.

NOTE: Analyses including plotted observational data are normally represented on a scale of 1:20 000 000.

3.2 Symbols for pictorial representation of data, analyses and forecasts on meteorological charts

Symbols for plotting are as given in Volume I, Attachment II.4.

NOTES: (l) In the USA degrees Fahrenheit are used for surface temperature and dew point.

(2) Plotting models for upper-air observations have not been standardized.

4. EXCHANGE OF PROCESSED PRODUCTS BETWEEN CENTRES – REGIONAL PRACTICES IN THE REGION

4.1 Requirements for WMC and RSMC output products from outside the Region

There are no requirements for WMC or RSMC products from outside the Region.

4.2 **Requirements for WMC and RSMC output products from inside the Region**

WMC and RSMC products required from within the Region are those listed without asterisks in Volume I, Attachments II.8 and II.9.

4.3 **Transmission priorities for WMC and RSMC output products exchanged on the regional segments of the GTS**

NOTE: Transmission priorities for WMC and RSMC output products are listed in Volume I, Attachments II.10, II.ll and II.12.

4.4 **WMC and RSMC output products which must be exchanged in pictorial form within the Region**

All required output products must be exchanged in pictorial form.

4.5 **WMC and RSMC output products which are to be exchanged within the Region using the FM 47-V GRID and/or FM 49-VII GRAF codes**

NOTE: The full set of output products from WMC Washington is available for exchange within the Region using the FM 47-V GRID code.

PART II

NON-REAL-TIME DATA PROCESSING – REGIONAL AND NATIONAL ASPECTS

1. DATA TO BE STORED AT CENTRES (RSMCs AND NMCs) WITHIN THE REGION

1.1 **Responsibilities for storage of observational and processed data at RSMCs within the Region**

WMC Washington, acting for RSMCs Miami and Montreal, is responsible for the storage of all data from the Region.

NOTE: In addition to the basic data given in Volume I, Part III, Attachment III.2, archives include SA, METAR and SN reports for Region IV, SM and SI for the globe, including national and regional supplementary data, and CLIMAT reports for the globe.

1.2 **Special requirements for storage of observational and processed data at NMCs within the Region**

NOTE: Responsibility for storage of climatological data is given in Volume I, Part III, paragraphs 2.2.1 – 2.2.3. Storage of additional data is according to the needs of the individual Member.

2. MINIMUM STANDARDS FOR QUALITY CONTROL OF NON-REAL-TIME DATA IN THE REGION

NOTE: Minimum standards for quality control of data for non-real-time use in the GDPS are given in Volume I, Attachment II.l.

2.1 **Regional standards for quality control**

WMC, RSMCs and NMCs should carry out routine standardized feedback of discrepancy information to data sources and record repositories for non-real-time observational record corrections.

2.2 **Agreements between Members for quality control**

NOTE: Routine reports of synoptic and upper-air deficiencies are mailed monthly by WMC Washington to all Members for inspection and resolution of data discrepancies.

2.3 **Standards established nationally, not included in global or regional standards, and of interest to other Members**

NMC Washington operates automatic systems for assessing and summarizing TEMP, PILOT, SYNOP and other types of data receipts, losses and/or discrepancies.

3. CLASSIFICATION AND CATALOGUING OF STORED DATA IN THE REGION

NOTE: Volume I, Part III, paragraph 4 gives recommended procedures for classification and cataloguing of stored data.

3.1 Regional procedures for classifying and cataloguing data stored at RSMCs

Regional procedures for classifying and cataloguing data stored at RSMCs are not established.

3.2 Regional procedures for classifying and cataloguing data stored at NMCs

Regional procedures for classifying and cataloguing data stored at NMCs are not established.

4. MEDIA AND FORMATS FOR EXCHANGE OF STORED DATA IN THE REGION

NOTE: Volume I, Part III, paragraphs 5.1 and 5.2 give recommended media and formats for the exchange of stored data.

4.1 Media for exchanging stored data within the Region

Regional practices shall conform with Volume I, Part III, paragraph 5.1.

NOTE: The exchange of data on 7-track tape is not recommended.

4.2 Formats for exchanging stored data within the Region

Regional practices shall conform with Volume I, Part III, paragraph 5.2, except in the case of bilateral agreements between Members.

4.3 Responsibilities of Members for exchange of non-real-time data within the Region

NOTE: The responsibilities of Members for exchange of non-real-time data within the Region are given in Volume I, Part III, paragraph 5.3.

PART III

MONITORING OF THE GDPS – REGIONAL AND NATIONAL ASPECTS

NOTE: Volume I, Attachment II-14 contains the Plan for Monitoring the Operation of the WWW. In this plan general guidelines and priorities are given for both real-time and non-real-time monitoring. Most of the items included in the monitoring programme are concerned with the quality of observations (see section 1 of Part I and section 2 of Part II above) and with telecommunications procedures. There are two items which can be considered as involving real-time data processing, namely:

(*a*) Adherence to regional coding procedures;

(*b*) Evaluation of processed information received at RSMCs and NMCs.

1. REGIONAL PROCEDURES FOR CARRYING OUT REAL-TIME MONITORING OF THE GDPS

1.1 Adherence to regional coding procedures

Members should avoid to the maximum possible extent any deviations from international coding procedures.

NOTE: No system for monitoring adherence to international coding procedures has been developed.

1.2 Evaluation of processed information received at RSMCs and NMCs

NOTE: WMC Washington has a number of verification programmes which may or may not be applicable to other countries. These include verification of winds, temperatures and height of numerical forecasts at various levels against rawinsonde reports for several networks or regions, using standard statistics. These regions include Central and North America.

2. REGIONAL PROCEDURES FOR CARRYING OUT NON-REAL-TIME MONITORING OF THE GDPS

2.1 Evaluation of processed information prior to storage

NOTE: See note to paragraph 1.2 above.

REGION V (SOUTH WEST PACIFIC)

PART I

REAL-TIME DATA PROCESSING – REGIONAL AND NATIONAL ASPECTS

1. MINIMUM STANDARDS FOR QUALITY CONTROL OF REAL-TIME DATA IN THE REGION

1.1 Regional standards for quality control

Regional standards for real-time quality control of both observational and processed data should be the same as the existing minimum global standards.

NOTE: Minimum standards for quality contol of data for real-time use in the GDPS are given in Volume I, Attachment II.1.

1.2 Agreements between Members for quality control

No agreements exist between Members for quality control of real-time data in the Region. However , agreements made for the FGGE on an interim basis (by the USA) have been continued.

1.3 Standards established nationally, not included in global or regional standards, and of interest to other Members

In the USA, real-time standards have been established with respect to the receipt time deadlines, completeness of reports and integrity of data. Standards vary according to data type and boundaries of models.

NOTE: Standards established nationally are included in WMO Publication 9, Volume B – *Data processing*.

2. OBSERVATIONAL DATA REQUIREMENTS AND TIMES OF RECEIPT OF OBSERVATIONAL DATA FOR REGIONAL EXCHANGE IN THE REGION

NOTE: The global standard practices and procedures concerning requirements for observational data and times of receipt of observational data are laid down in Volume I, Part II, paragraphs 2.2 and 2.3.

2.1 Types of observational data required within the Region

2.1.1 Types of observational data required from within the Region are obtained from:

(*a*) Regional basic synoptic network: the Regional Association has agreed to the following observing programme for surface and upper-air observations:

(i) All the surface stations included in the regional basic synoptic network should make surface synoptic observations at the four main standard times of observation, i.e. 00, 06, 12 and 18 UTC, and at the four intermediate standard times of observation, i.e. 03, 09, 15 and 21 UTC. Any surface station which cannot carry out the full observational programme should give priority to the carrying out of the observations at the main standard times;

(ii) All the radiowind stations included in the regional basic synoptic network should make upper-wind observations up to the 10 hPa level at 00, 06, 12 and 18 UTC;

(iii) All the radiosonde stations included in the regional basic synoptic network should make observations of pressure, temperature and humidity up to the 10 hPa level at 00 and 12 UTC;

(iv) Any radiosonde stations which cannot carry out at present their full programmes should give priority to making and disseminating the 00 UTC observations (Rec. 21 (CBS-VI));

NOTE: Information on the state of implementation of the Region V basic network of obser ving stations is given in WMO Publication No. 217.

(*b*) Mobile ships;

(*c*) Aircraft weather reports for synoptic purposes;

(*d*) Ground weather radar stations;

(*e*) Near-polar-orbiting meteorological satellites, in particular the following:

(i) Vertical temperature and moisture soundings;

(ii) Sea-surface temperature;

(iii) Imagery;

(*f*) Geostationary environmental meteorological satellites and certain WEFAX products received from WMC Washington, in particular:

(i) Wind vectors;

(ii) Imagery.

2.1.2 In addition, types of observational data required within the Region include:

Hourly or three-hourly surface observations from land and sea stations, exchanged regionally or according to bilateral agreements.

2.2 Types of observational data required from outside the Region

Same as those for global exchange listed in Volume I, Attachment II.2 and Volume I of the *Manual on the GTS*, Attachment I-3.

NOTE: Stations for regional exchange of SYNOP reports at the main standard times of observation are listed in Volume II of the *Manual on the GTS,* Attachment V-1.

2.3 Times of receipt of observational data

(*a*) From within the Region

SYNOP	to be received by	H + 2h
TEMP and PILOT	to be received by	H + 3h

(*b*) From outside the Region

SYNOP	to be received by	H + 4h
TEMP and PILOT	to be received by	H + 4h

NOTE: Times of receipt of observational data for use in the GDPS are given in Volume I, Attachment II.3.

3. PICTORIAL REPRESENTATION OF INFORMATION – REGIONAL AND NATIONAL ASPECTS IN THE REGION

3.1 Scales and projections of meteorological charts

Special practices followed by certain Members are given below:

Indonesia: For stream and stream-function charts between latitude 20°N and 15°S, Mercator projection is used, scale 1:20 000 000;

New Caledonia: Tropical and temperate regions: Mercator projection
Polar regions: stereographic projection

USA: Scales: polar stereographic 1:20 000 000 1:40 000 000
Mercator 1:20 000 000 1:40 000 000

NOTE: A selection of scales which should be used for weather charts in the GDPS is given in Volume I, Part II, paragraph 4.1.2.

3.2 Symbols for pictorial representation of data, analyses and forecasts on meteorological charts

Same as those given in Volume I, Attachment II.4.

4. EXCHANGE OF PROCESSED PRODUCTS BETWEEN CENTRES – REGIONAL PRACTICES IN THE REGION

NOTE: The global standard and recommended practices and procedures concerning the programmes of output products, the transmission priorities and the responsibilities of Members for providing information on their real-time data-processing activities are laid down in Volume I, Part II, paragraphs 5.2, 5.3 and 5.4 respectively. Several lists dealing with WMC/RSMC output products are given in the attachments to paragraphs 5.2 and 5.3. Detailed information on the programmes for preparation of output products by WWW centres is given in WMO Publication No. 9, Volume B – *Data processing*.

4.1 Requirements for WMC and RSMC output products from outside the Region

The following special requirements have been indicated by Members:

(*a*) Extended-period forecasts from global models run by northern hemisphere centres, e.g. European Centre of Medium Range Weather Forecasts – ECMWF (by Australia);

(*b*) All processed data of satellite imageries (GOES-W) concerning the South Pacific (upper winds, temperature, state of sea) produced by WMC Washington (by French Polynesia);

(*c*) The following data from ECMWF (by Malaysia);

(i) Objectively analysed upper-air data at grid points;

(ii) Predicted upper-air data at grid points.

4.2 Requirements for WMC and RSMC output products from inside the Region

4.2.1 The requirements are the same as those given in Attachments II.8 to II.12 of Volume I.

4.2.2 The following special requirements have been indicated by Members:

(*a*) Observational and processed data for the area Equator to 20°N (Pacific Islands) for safety of international flights towards Tokyo (by New Caledonia);

(*b*) Reports of solar energy, soil temperature and soil moisture obser vations to be used in developing agricultural weather products (by the USA);

(*c*) Consistent reports of 24-hour precipitation amounts, extreme temperatures, state of the ground, snow depth and new snowfall (by the USA);

(*d*) Southern hemisphere analysis and prognosis for MSL and 500 hPa (by New Zealand).

4.3 Transmission priorities for WMC and RSMC output products exchanged on the regional segments of the GTS

First priority: Area Forecast System charts, issued in accordance with the appropriate ICAO Regional Air Navigation Agreements, including prognoses for:

- 500, 300, 250, 200 and 100 hPa (if required for SST operations);
- Tropopause/maximum wind;
- Tropopause/vertical wind shear;
- Significant weather charts;

Second priority: Analyses and prognoses from the WMC and RSMCs in Region V;

Third priority : Certain critical analyses and prognoses required from RSMCs outside Region V;

Fourth priority: A selection of WMC products.

4.4 WMC and RSMC output products which must be exchanged in pictorial form within the Region

(To be developed.)

4.5 WMC and RSMC output products which are to be exchanged within the Region using the FM 47-V GRID and/or FM 49-VII GRAF codes

(To be developed.)

PART II

NON-REAL-TIME DATA PROCESSING – REGIONAL AND NATIONAL ASPECTS

1. DATA TO BE STORED AT CENTRES (RSMCS AND NMCS) WITHIN THE REGION

NOTE: The general responsibilities for storage of data at RSMCs are given in Volume I, Part III, paragraph 2.1.2 and Attachment III.2.

1.1 Responsibilities for storage of observational and processed data at RSMCs within the Region

(*a*) Members concerned ensure that their RSMCs provide for the storage and retrieval of basic obser vational data received through the GTS for the zones of responsibility as indicated below:

RSMC Melbourne: The zones of responsibility of WMC/RTH Melbourne for collection of obser vational data (acting for RSMC Darwin)

RSMC Wellington: The zone of responsibility of RTH Wellington for collection of observational data;

(*b*) The following regional practices are recommended:

(i) Basic SYNOP and TEMP data should be stored on magnetic tapes;

(ii) Analysed products should be stored on microfilm;

(iii) A thorough archive of observational and numerical model data needs to be constructed;

(iv) Observational data should be stored permanently and processed data for at least 20 years. Processed data such as numerical model forecasts or analyses need to be stored for only 10–15 years.

1.2 Special requirements for storage of observational and processed data at NMCs within the Region

(*a*) Observational and processed data at the NMCs should be stored on magnetic tape or disc in a standardized international digital format;

(*b*) See remark under 1.1 (*b*)(iv).

2. MINIMUM STANDARDS FOR QUALITY CONTROL OF NON-REAL-TIME DATA IN THE REGION

NOTE: Minimum standards for quality control of data for non-real-time use in the GDPS are given in Volume I, Attachment II.l.

2.1 Regional standards for quality control

Regional standards for quality control of non-real-time data are the same as those specified in Volume I, Attachment II.l.

2.2 Agreements between Members for quality control

New Zealand performs on an interim basis non-real-time quality control of data on behalf of Cook Islands, Kingdom of Tonga, Kiribati and Tuvalu.

2.3 Standards established nationally, not included in global or regional standards, and of interest to other Members

In the USA, standards have been established nationally based on relative performance among reporting locations. Standards are continuously raised by concentrating on below-average stations and communication links. Performance evaluations are issued weekly, fortnightly, monthly, semi-annually, and annually. Substandard performance is identified, evaluated and corrected.

3. CLASSIFICATION AND CATALOGUING OF STORED DATA IN THE REGION

NOTE: Volume I, Part III, paragraph 4 establishes recommended procedures for classification and cataloguing of stored data.

3.1 Regional procedures for classifying and cataloguing data stored at RSMCs

No regional procedures exist. It is recommended that:

(*a*) The stored data be classified into two categories, namely:

(i) Basic surface and upper-air data;

(ii) Analysed data such as surface and upper-air charts.

The first category can be further classified into hourly, daily and monthly data types, while the second category can be classified into daily and monthly mean charts;

(*b*) A catalogue at one or more centres in Region V be maintained;

(*c*) Suitable regional practices be formulated by *ad hoc* panels representing global, regional and national interests.

3.2 Regional procedures for classifying and cataloguing data stored at NMCs

See remarks under paragraph 3.1.

4. MEDIA AND FORMATS FOR EXCHANGE OF STORED DATA IN THE REGION

NOTE: Volume I, Part III, paragraphs 5.1 and 5.2 give recommended media and formats for exchange of stored data.

4.1 Media for exchanging stored data within the Region

The following medium is recommended for use in the Region:

Magnetic tape with 9 tracks, $^1/_2$ inch wide, with 800 or 1600 BPI.

4.2 Formats for exchanging stored data within the Region

The standard format as given in WMO Publication No. 469 is recommended.

4.3 Responsibilities of Members for exchange of non-real-time data within the Region

The following recommendations are made for use in the Region:

(*a*) Inventories of stored data should be produced and disseminated by Members to facilitate easy reference;

(*b*) Routine CLIMAT and CLIMAT TEMP messages should be exchanged;

(*c*) Stored data exchanged within the Region should be published in a suitable WMO publication and provided to Members.

PART III

MONITORING OF THE GDPS – REGIONAL AND NATIONAL ASPECTS

NOTE: Volume I, Attachment II.14 contains the Plan for Monitoring the Operation of the WWW. In this plan, general guidelines and priorities are given for both real-time and non-real-time monitoring. Most of the items included in the monitoring programme are concerned with the quality of observations (see section 1 of Part I and section 2 of Part II above) and with telecommunication procedures. There are two items which can be considered as involving real-time data processing, namely:

(*a*) Adherence to regional coding procedures;

(*b*) Evaluation of processed information received at RSMCs and NMCs.

1. REGIONAL PROCEDURES FOR CARRYING OUT REAL-TIME MONITORING OF THE GDPS

1.1 Adherence to regional coding procedures

The following recommendations are made for use in the Region:

(*a*) Periodic automatic and manual checks should be undertaken by the centre;

(*b*) NMCs should be responsible for meteorological checking of information collected and should ensure adherence to regional coding procedures before insertion on the GTS;

(*c*) Monitoring should be carried out as specified in V olume I, Attachment II.14. In particular , the heading, the correct number of groups, and the correct number of figures of all messages should be checked.

1.2 Evaluation of processed information received at RSMCs and NMCs

The following recommendations are made for use in the Region:

(*a*) Analysed charts should be checked by examining the correct positioning of the Lows and Highs and direction of the streamlines;

(*b*) Processed data should be reviewed or re-analysed prior to storage;

(*c*) Automated validation of data should be carried out and standard flags set on suspect data.

2. REGIONAL PROCEDURES FOR CARRYING OUT NON-REAL-TIME MONITORING OF THE GDPS

2.1 Evaluation of processed information prior to storage

See paragraph 1.2 above.

REGION VI (EUROPE)

PART I

REAL-TIME DATA PROCESSING – REGIONAL AND NATIONAL ASPECTS

1. MINIMUM STANDARDS FOR QUALITY CONTROL OF REAL-TIME DATA IN THE REGION

1.1 Regional standards for quality control

The existing minimum global standards are satisfactory for both observational and processed data. No regional standard is required.

NOTE: Minimum standards for quality control of data for real-time use in the GDPS are given Volume I, Attachment II.1.

1.2 Agreements between Members for quality control

No agreement exists between Members for quality control of real-time data in the Region.

1.3 Standards established nationally, not included in global or regional standards, and of interest to other Members

No national standard of interest to other Members.

2. OBSERVATIONAL DATA REQUIREMENTS AND TIMES OF RECEIPT OF OBSERVATIONAL DATA FOR REGIONAL EXCHANGE IN THE REGION

NOTE: The global standard practices and procedures concerning requirements for observational data and times of receipt of observational data are laid down in Volume I, Part II, paragraphs 2.2 and 2.3.

2.1 Types of observational data required from within the Region

Types of observational data required from within the Region, as noted by the seventh session of Regional Association VI, are obtained from:

(*a*) Regional basic synoptic network: the Regional Association has agreed (Res. 2 (VII-RA VI) to the following observing programme for surface and upper-air observations:

(i) All surface stations included in the regional basic synoptic network should make surface observations at the four main standard times of observation, i.e. 00, 06, 12 and 18 UTC, and at the four intermediate standard times of observation, i.e. 03, 09, 15 and 21 UTC. Any surface station that cannot carry out the full observational programme should be given priortiy to the carrying out of the observations at the main standard time;

(ii) All the upper-air stations included in the regional basic synoptic network should carry out radiosonde and radiowind observations reaching regularly* at least the 30 hPa level at 00 and 12 UTC, and radiowind observations reaching regularly* at least the 70 hPa level at 06 and 18 UTC. The carrying out of radiowind observations at 00 and 12 UTC should receive priority over radiowind observations at 06 and 18 UTC;

NOTE: Information on the state of implementation of the RA VI regional basic synoptic network is given in WMO Publication No. 217.

(*b*) Fixed sea stations;

Minimum requirements of four ocean weather stations is as follows:
Station L: 57°00′N, 20°00′W
Station M: 66°00′N, 02°00′E
Station R: 47°00′N, 17°00′W
Station C: 52°45′N, 35°30′W

(*c*) Mobile ships;

(*d*) Aircraft

(*e*) Radar observations;

(*f*) Near-polar-orbiting meteorological satellites;

(*g*) Geostationary meteorological satellites;

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* The expression ‘regular’ means that the levels indicated should be reached with a frequency of at least 90 per cent of the ascents.

2.2 Types of observational data required from outside the Region

2.2.1 *Data which are included in the global exchange programme*

Special requirements indicated by certain Members are as follows:

NOTE: The types of observational data for global exchange are listed in Volume I, Attachment II.2 of this *Manual* and in Volume I of the *Manual on the GTS* Attachment I-3.

2.2.2 *Data which are not included in the global exchange programme*

(*a*) DRIBU reports
(*b*) ROCOB reports
} as required for inter-regional exchange

NOTE: Stations for the regional exchange of SYNOP reports at the main standard times of observation are listed in Volume II of the *Manual on the GTS*, Attachment III-1.

2.3 Times of receipt of observational data

(*a*) From within the Region:

SYNOP
TEMP and PILOT
} to be received by { H + $1^1/_2$h
H + $1^1/_2$h

(*b*) From outside the Region:

SYNOP
TEMP and PILOT
} to be received by { H + $2^1/_2$h
H + $3^1/_2$h

NOTE: Times of receipt of observational data for use in the GDPS are given in Volume I, Attachment II.3.

3. PICTORIAL REPRESENTATION OF INFORMATION – REGIONAL AND NATIONAL ASPECTS IN THE REGION

3.1 Scales and projections of meteorological charts

NOTE: A selection of scales which should be used for weather charts in the GDPS is given in Volume I, Part II, paragraph 4.1.2.

3.2 Symbols for pictorial representation of data, analyses and forecasts on meteorological charts

NOTE: Symbols used for pictorial representation of data, analyses and forecasts on meteorological charts are given in Volume I, Attachment II.4.

4. EXCHANGE OF PROCESSED PRODUCTS BETWEEN CENTRES – REGIONAL PRACTICES IN THE REGION

NOTE: The global standard and recommended practices and procedures concerning the programmes of output products, the transmission priorities and the responsibilities of Members for providing information on their real-time data-processing activities are laid down in Volume I, Part II, paragraphs 5.2, 5.3 and 5.4 respectively. Several lists dealing with WMC/RSMC output products are given in the attachments to paragraphs 5.2 and 5.3. Detailed information on the programmes for preparation of output products by WWW centres is given in WMO Publication No. 9, Volume B – *Data processing*.

4.1 Requirements for processed products from outside the Region

(See paragraph 4.5 below.)

4.2 Requirements for processed products from inside the Region

(See paragraph 4.5 below.)

4.3 Transmission priorities for processed products exchanged on the regional segments of the GTS

(See paragraph 4.5 below.)

4.4 Processed products which must be exchanged in pictorial form within the Region

A provisional list of products which must be exchanged in pictorial form within the Region is given in Attachment I.

4.5 Processed products which are to be exchanged within the Region using the FM 47-V GRID and/or FM 49-VII Ext. GRAF codes

(*a*) The guidelines on the general exchange of numerical products on the GTS in RA VI are given in Attachment II;

(*b*) The standard regional products in RA VI are given in Attachment III.

PART II

NON-REAL-TIME DATA PROCESSING – REGIONAL AND NATIONAL ASPECTS

1. DATA TO BE STORED AT CENTRES (RSMCs AND NMCs) WITHIN THE REGION

NOTE: The general responsibilities for storage of data at RSMCs are given in Volume I, Part III, paragraph 2.1.2 and Attachment III.2.

1.1 Responsibilities for storage of observational and processed data at RSMCs within the Region

(To be developed.)

1.2 Special requirements for storage of observational and processed data at NMCs within the Region

The followin are special requirements for storage of data at NMCs with the Region:

(*a*) Hungary: SYNOP from Europe four times a day, from Carpathian basin eight times a day;

(*b*) Sweden: Globa ship observations carried out by Swedish ships;

(*c*) Yugoslavia: Data needed for Alpine databank used for ALPEX.

2. MINIMUM STANDARDS FOR QUALITY CONTROL OF NON-REAL-TIME DATA IN THE REGION

NOTE: Minimum standards for quality control of data for non-real-time use in the GDPS are given in Volume I, Attachment II.l.

2.1 Regional standards for quality control

(To be developed.)

2.2 Agreements between Members for quality control

(To be developed.)

2.3 Standards established nationally, not included in global or regional standards, and of interest to other Members

(To be developed.)

3. CLASSIFICATION AND CATALOGUING OF STORED DATA IN THE REGION

NOTE: Volume I, Part III, paragraph 4 establishes recommended procedures for the classification and cataloguing of stored data.

3.1 Regional procedures for classifying and cataloguing data stored at RSMCs

(To be developed.)

3.2 Regional procedures for classifying and cataloguing data stored at NMCs

(To be developed.)

4. MEDIA AND FORMATS FOR EXCHANGE OF STORED DATA IN THE REGION

NOTE: Volume I, Part III, paragraphs 5.1 and 5.2 give recommended media and formats for the exchange of stored data.

4.1 Media for exchanging stored data within the Region.

The following media are recommended for use within the Region:

(*a*) Magnetic tape with 9 tracks, $^1/_2$ inch wide, with and 800 BPI;

(*b*) Standard paper tape with 5 or 8 tracks, using international alphabets Nos. 2 and 5 respectively.

4.2 Formats for exchanging stored data within the Region

(To be developed.)

4.3 Responsibilities of Members for exchange of non-real-time data within the Region

(To be developed.)

PART III

MONITORING OF THE GDPS – REGIONAL AND NATIONAL ASPECTS

NOTE: Volume I, Attachment II.14 contains the Plan for Monitoring the Operation of the WWW . In this plan general guidelines and priorities are given for both real-time and non-real-time monitoring. Most of the items included in the monitoring programme are concerned with the quality of observations (see section 1 of Part I and section 2 of Part II above) and with telecommunications procedures. In addition real-time monitoring is required as regards:

(*a*) Adherence to regional coding procedures;

(*b*) Evaluation of processed information received at RSMCs and NMCs.

1. REGIONAL PROCEDURES FOR CARRYING OUT REAL-TIME MONITORING OF THE GDPS

1.1 Adherence to regional coding procedures

(To be included later.)

1.2 Evaluation of processed information received at RSMCs and NMCs

(To be developed after CBS, in consultation with CAS, has elaborated verification procedures for use in the GDPS.)

2. REGIONAL PROCEDURES FOR CARRYING OUT NON-REAL-TIME MONITORING OF THE GDPS

2.1 Evaluation of processed information prior to storage

(See paragraph 1.2 above.)

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ATTACHMENT I (PROVISIONAL)

LIST OF PRODUCTS WHICH MUST BE EXCHANGED IN PICTORIAL FORM

(*Ref. Part I, paragraph 4.4*)

1. There are certain output products which need to be exchanged in pictorial form because of the following characteristics:

(*a*) Plotted data indicated on the chart;

(*b*) Frontal symbols indicated by curves;

(*c*) Isohypses or contour lines combined with plotted data;

(*d*) Jet stream marked and direction of flow indicated;

(*e*) Symbols which cannot be described by grid-point data;

(*f*) Products in pictorial form intended to be received on board ships or at other locations unable to handle digital data.

2. The list of these products is as follows:

- Surface plotted data;
- Upper-air plotted data;
- Surface analysis with plotted data and/or fronts;
- Surface forecast with fronts;
- Upper-air charts with plotted data
- Tropopause and maximum wind charts;
- Significant weather charts;
- Nephanalyses.

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ATTACHMENT II

GUIDELINES ON THE GENERAL EXCHANGE OF NUMERIAL PRODUCTS ON THE GTS IN RA VI

(*Ref. Part I, paragraph 4.5 (a)*)

The guidelines should not inhibit the exchange of other products on a bilateral basis where communications capacity is available. In certain cases exchanges agreed on a bilateral basis may have to take prority over the general exchange products (e.g. for back-up arrangements). Products should be exchanged only when there is a requirement.

1. **Medium-range products (beyond H + 72 and all ECMWF)**

Sea-level/near surface	H/P	T	W	R
850 hPa	H	T	W	R
500 hPa	H	T	W	R
250/200 hPa	H	T	W	

2. **Products beyond H + 36, up to and including H + 72**

Sea-level/near surface	H/P	T	W	R
850 hPa	H	T	W	R
700 hPa	H	T	W	R
500 hPa	H	T	W	R
250/200 hPa	H	T	W	
100 hPa	H	T	W	

3. **Analysis and forecast products up to and including H + 36**

Sea-level/near surface	H/P	T	W	R
850 hPa	H	T	W	R
700 hPa	H	T	W	R
500 hPa	H	T	W	R
400 hPa	H	T	W	
300 hPa	H	T	W	
250 hPa	H	T	W	
200 hPa	H	T	W	
150 hPa	H	T	W	
100 hPa	H	T	W	
Tropopause and maximum wind	H/P	T	W	
Vertical velocity				
Precipitation				
Wave and swell				

4. **Validity times**

(*a*) Moscow, Bracknell, Offenbach, Paris
00 UTC and 12 UTC
H + 0, 6, 12, 18, 24, 30, 36, 48, 60, 72, 96, 120 (where available)

(*b*) Washington

00 UTC and 12 UTC	H + 0, 12, 24, 36, 60, 72
00 UTC only	H + 84, 96, 108, 120

(*c*) ECMWF

12 UTC only	H + 0, 12, 24, 36, 48, 60, 72, 84, 96, 108, 120

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NOTE: H/P, geopotential height/pressure; T, temperature; W, wind; R, humidity.

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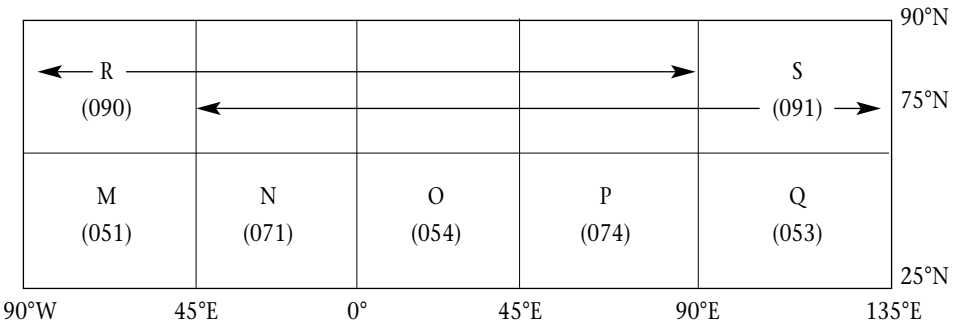
ATTACHMENT III

STANDARD REGIONAL PRODUCTS IN RA VI

(*Ref. Part I, paragraph 4.5 (b)*)

1. **Areas**

There are seven standard areas as shown.



2. **Resolution**

Areas M – Q $1/2° \times 2 1/2°$.

Areas R and S $2 1/2° \times 10°$

3. **Boundaries**

The grid points lying on the boundary between two areas are included in both areas.

4. **Reference points**

The reference points are at the north-west corners of the areas.

5. **Area catalogue numbers (NNN)**

The catalogue numbers 051, 071, 054, 074, 053, 090, 091 are used for areas M – S shown above. For areas M – Q, the numbers have been derived from those used (001–012) for standard global/hemispheric products (areas A – L), by adding 050 for the western part and 070 for the eastern part. A separate series, beginning at 090, has been instituted for the polar areas.

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THE ANTARCTIC

DATA-PROCESSING ACTIVITIES AND METEOROLOGICAL SERVICES IN THE ANTARCTIC

1. It is proposed that data-processing and meteorological service functions be carried out by the following stations in the Antarctic:

Casey (Davis carried out this responsibility up to October 2003)
McMurdo
Marambio
Presidente Frei
Rothera

2. The functions proposed for stations in the Antarctic providing data-processing and other meteorological services, including services for shipping, aircraft, local operations and research, are:

(*a*) Preparation of meteorological analyses and prognoses for the whole of the Antarctic or for defined sectors thereof, and making them promptly available to other stations inside or outside the Antarctic;

(*b*) Preparation of specialized meteorological forecasts for users (marine and aviation interests, traverse parties, etc.), and making them promptly available to other stations inside or outside the Antarctic. Products that may be required should include for the relevant areas and subject to seasonal variation:

- Surface analyses with frontal positions and present weather at 0000, 0006, 1200 and 1800 UTC;
- Surface prognostic charts showing frontal positions and weather forecast for up to two days and longer where possible;
- Local area forecasts in support of remote aircraft operations on request;
- Upper-air analysis for 0000 and 1200 UTC for the standard levels (H, W, T);
- Uppeer-air forecasts for the standard levels for up to two days and longer where possible (H, W, T);
- Swell and wave (sea state) analysis for 0000 and 1200 UTC and forecasts for up to two days;
- Sea-ice analysis at about 20 km resolution or better with prognoses for up to two days;
- Local sea-ice analyses on request;
- Satellite orbital data in the appropriate code form on request;

(*c*) Preparation and distribution of warnings of dangerous weather conditions for the area for which the station prepares analyses, prognoses or specialized forecasts; products that may be required should include forecasts of icing conditions and other dangerous weather for surface, ship and air operations;

(*d*) Support for research activities as required.

3. Criteria for inclusion of an Antarctic station in the list of stations proposed in paragraph 1 are:

(*a*) That the station is willing to carry out the functions indicated in paragraph 2 above to the maximum extent possible;

(*b*) That the station has, or will have in the near future, the capability of carrying out the functions adequately;

(*c*) That at least one other station inside or outside the Antarctic requires the processed information available from the station;

(*d*) That the station should have adequate telecommunication facilities to receive observational data and exchange and distribute processed information with other stations as required.

NOTE: It is recognized that the carrying out of these functions indicated in paragraph 2 above is subject to seasonal variations between the austral summer and winter.

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