

Expected Result 5

DEVELOPMENT AND IMPLEMENTATION OF THE NEW WMO INFORMATION SYSTEM

Strategic Thrust 1: Science and Technology Development and Implementation

SUMMARY

ISSUES TO BE DISCUSSED:

1. WIS development and implementation
2. Data representation and codes
3. Climate Data Management and Exchange
4. Coordination with related information systems

ADDITIONAL FINANCIAL IMPLICATION:

None

DECISIONS/ACTIONS REQUIRED:

- (a) Guidance of WIS development and implementation in Region V;
- (b) Guidance on development and implementation of operation-critical data exchange and management;
- (c) Proposed reestablishment of an information systems and services working group.

REFERENCES:

1. *Abridged Final Report with Resolutions of the Fifteenth World Meteorological Congress* (WMO-No. 1026)
2. *Abridged Final Report with Resolutions of the Fourteenth Session of CBS* (WMO-No. 1040)
3. *Abridged Final Report with Resolutions of the Sixty-first Session of the Executive Council* (WMO-No. 1042)

CONTENT OF DOCUMENT:**Appendix for inclusion in the final report:**

Draft text for inclusion in the general summary of XV-RA V

Appendix for information:

XV-RA V/Rep. 4.5: Progress/Activity Report

DRAFT TEXT FOR INCLUSION IN THE GENERAL SUMMARY OF XV-RA V

4.5 DEVELOPMENT AND IMPLEMENTATION OF THE NEW WMO INFORMATION SYSTEM (*agenda item 4.5*)

WIS development and implementation strategy

WIS Implementation Plan

4.5.1 The Association recalled that the WIS would provide three fundamental types of services to meet the different requirements, as follows:

- (a) Routine collection and dissemination service for time-critical and operation-critical data and products;
- (b) Data Discovery, Access and Retrieval service;
- (c) Timely delivery service for data and products.

4.5.2 WIS implementation should build upon existing WMO information systems in a smooth and evolutionary process. The WIS Implementation Plan has two parts that would be developed in parallel:

- (a) Part A: the continued consolidation and further improvements of the Global Telecommunication System (GTS) for time-critical and operation-critical data, including its extension to meet operational requirements of WMO Programmes in addition to the World Weather Watch (WWW), including improved management of services;
- (b) Part B: an extension of the information services through flexible data discovery, access and retrieval services to authorized users, as well as flexible timely delivery services; it would be implemented essentially through the Internet.

Progress in the improvement to the GTS (Part A of WIS)

4.5.3 The Association noted that with regards to Part A, considerable progress has been made in RA V with the continuous improvement of the Regional Meteorological Telecommunications Network (RMTN). This has been primarily through the migration from Frame Relay Services to Multi-protocol Label Switching (MPLS) clouds. There are now three MPLS clouds within RA V. One is the Improved Main Telecommunication Network (IMTN) operated by OBS (Orange Business Services), and managed by the European Centre for Medium-Range Forecasts (ECMWF) as an extension to the MPLS cloud supporting RA VI. This cloud connects WMC Melbourne to RTH Tokyo, WMC Washington and RTH Exeter. The second MPLS cloud is operated by SingTel, and connects Singapore to Jakarta, Melbourne, Kuala Lumpur, Bangkok and Tokyo. The third MPLS cloud is NOAANet, servicing the northern Pacific centres of Honolulu and Guam from Washington.

4.5.4 The Association noted that in addition to the MPLS clouds, many centres use the Internet as their prime connection, running standard GTS procedures to reliably exchange data and products. The Internet has also demonstrated its reliability as a medium for GTS backup circuits, with WMC Melbourne able to maintain normal operations for extended periods to Tokyo, Washington and Exeter.

4.5.5 The Association emphasized that despite advances in many areas, some centres in RA V still rely on satellite broadcasts, digital HF radio and e-mail for access to the GTS, and although the Internet is available to almost all centres, it still remains very expensive and unreliable in the Pacific for NMHS operations. Problems are often associated with limited bandwidth availability so that e-mails containing observations and forecasts can be significantly delayed or even lost.

4.5.6 The Association noted that RANET is effectively moving from a pilot project to an operational system for several centres within the Region. It noted the need for a central reporting procedure for RANET support activities, the provision of a central repository of documentation and software, enhancing the current ad hoc technical support provided by Wellington on a best efforts basis, and further training activities, in addition to those planned by Wellington in the coming year, in order for RANET to be sustained in the long-term. The Association thanked New Zealand for its efforts and encouraged each centre utilizing RANET to appoint an in-country coordinator to assist Wellington in maintaining and enhancing RANET services.

4.5.7 The Association noted that there remain significant variations in communications technologies available across RA V. It was pleased that consideration is now being given to bringing other centres to MPLS, providing such transitions are economically and technically viable. It supported such initiatives as the establishment of a Manila – Melbourne link as an operational circuit that has been proposed by Manila. However, the Association is concerned that two centres (Tokelau and Dili) still do not have a connection to the GTS and encouraged Members to work together to address these shortcomings of the RA V connectivity as a matter of priority.

4.5.8 The Association noted that WIGOS is crucially dependant upon effective WIS support and services, e.g., the specialized data collection means, the generation, collection, management and handling of related metadata and the distribution, of and access to, the data. It invited RA V Members to contribute, in coordination with ICG-WIS, the EC Working Group on WIGOS-WIS and relevant technical commissions activities, to ensure that the WIS elements and components required respectively for the implementation of the WIGOS pilot projects are developed and coordinated to meet the respective projects' aims and requirements.

Amendments to the Manual on the GTS, Volume II, Region V

4.5.9 The Association agreed on amendments to the Manual on the GTS, Volume II, Region V as follows:

To include the following circuits:

- (a) Manila-Melbourne (as agreed by PIW meeting);
- (b) Dili-Melbourne (not included in the Manual);
- (c) Tokelau-Wellington;
- (d) Apia-Wellington;
- (e) Tonga-Wellington;
- (f) Niue-Wellington;
- (g) Rarotonga-Wellington;
- (h) Tarawa-Wellington;

- (i) Funafuti-Wellington;
- (j) Pago Pago-Honolulu;
- (k) Palau-Honolulu;
- (l) Pohnpei-Honolulu;
- (m) Majuro-Honolulu;
- (n) Guam-Washington;
- (o) Nadi-Washington (replaces Nadi-Honolulu).

The Association requested the Secretary-General to amend the Manual on the GTS accordingly.

Implementation of the new functionality of WIS (Part B of WIS)

4.5.10 The Association recalled that the Fifteenth Congress endorsed in principle WIS procedures for the designation of Global Information System Centres (GISCs) and Data Collection or Production Centres (DCPCs) and encouraged Members to adhere to them. It noted that, upon the request from the sixtieth session of the Executive Council, the Secretariat had requested Members to identify potential GISCs and DCPCs centres with supporting information. Members' contribution on identified GISC and/or DCPC(s) was reviewed by an ad hoc ICG-WIS task group and by CBS-XIV and consolidated for presentation to the sixty-first session of the Executive Council. The Association noted with appreciation that four Region V Members (Australia, New Zealand and Fiji, as well as the USA for Hawaii) have identified collectively one potential GISC and seven potential DCPCs associated to RA V Centres. These will fulfil, within specific WMO Programmes, an international responsibility for the collection/generation and provision of data, forecast products, processed or value-added information (e.g., RSMCs). The Association fully supported the candidate GISC and DCPCs, and invited the Members operating these centres to make their best implementation and preparatory efforts towards demonstrations of capabilities of candidate WIS centres at the CBS extraordinary session (November 2010), with a view to a formal designation by Cg-XVI in May 2011.

4.5.11 The Association expressed its appreciation that WMC Melbourne had offered to be a GISC serving RA V. It noted that WMC Melbourne's new connection via MPLS on the IMTN means RA V is now connected to the WIS core network and that the various communication technologies making up the present RA V RMTN will become the WIS Area Meteorological Data Network (AMDCN).

4.5.12 Noting the availability of WIS reference documentation including the WIS Project and Implementation Plan, the WIS Functional Architecture and the WIS Compliance Specifications, the Association noted that the WIS User Requirements have progressed little during 2009. It highlighted the request from ICG-WIS for Members to provide the necessary information to support the WIS Rolling Review of Requirements (RRR) process. The Association urged its relevant working groups to actively pursue their contributions to the refinement of WIS User Requirements to ensure that the regional programmes requirements on WIS are taken into account.

4.5.13 The Association emphasized the importance of appropriate regulatory and guidance documentation on the WIS. It noted and supported the important building blocks that were developed towards the future "Manual on WIS" including the WIS Compliance Specifications and the WIS Functional Architecture. It noted that CBS re-affirmed the high-priority need for the

development of the Manual on WIS, based on the experience gained through early WIS implementation.

4.5.14 The Association was aware that WIS information Discovery, Access and Retrieval (DAR) services, based on request/reply “pull” mechanism operated essentially through the Internet, are the salient extensions of services that will be provided by WIS. The Association agreed that CBS and the ICG-WIS should urgently develop recommended procedures and practices, based on international standards and current technologies, for adequate authentication and authorization mechanisms to enable and manage the use of the service, at national and international levels, by authorized users. It especially requested that guidance and training be provided on the creation, management and use of metadata that underlies the DAR services.

4.5.15 The Association emphasized the need for capacity building in developing countries to enable them to participate in WIS, taking into account the capabilities, opportunities and constraints of the NMHSs of developing countries. Noting the high value of WIS pilot projects, the Association urged its relevant working groups, with the support and coordination of the ICG-WIS, to develop and promote pilot projects that facilitate the introduction of WIS functions and services. It invited NMHSs from developed countries, and in particular those participating in the early phase of WIS implementation, to support and assist in these initiatives. In particular it supported the recommendation of the RA V Working Group on Planning and Implementation of the World Weather Watch that the Region should take advantage of the support of the Secretariat’s JumpStart offer to establish the new functionality of WIS at some RA V centres, including an RTH, RSMC and at least one Small Island Developing State. It would also be useful if the demonstration included a non-WMO centre to show how they could link to WIS.

Data representation and codes

4.5.16 The Association noted that significant work is being undertaken within CBS on data representation and codes. Of particular importance to RA V are discussions in JCOMM on the importance of uniform codes supporting the sea level monitoring in the Region and the impact on the cost and maintenance of tools related to ocean warning services such as tsunamis and storm surge. It also noted the work being undertaken on a common alerting protocol (CAP) under PWS and its associated registry of alerting authorities. It was pleased that the transmission of the CAP message via the GTS would not be difficult to facilitate, although it noted there are some concerns about populating the spatial distribution elements of the protocol.

4.5.17 The Association noted with appreciation the action taken by Dr Weiqing Qu, the Rapporteur on the Regional TDCF Migration Plan, with a view to the migration in Region V. [*The timelines for migration to TDCF are provided in Table 1 of the Annex to paragraph 6.1 of XV-RA V/Rep. 4.5.*] It noted that positive progress on migration at a number of centres and how the Wellington Message Switch Upgrade presently in pre-operational mode would facilitate code migration for a number of centres within its area of responsibility. However, it emphasized that complete migration to TDCF will need forecasting tools used in smaller centres to be upgraded to support TDCF. It also noted that dependence on HF e-mail and SMS prompts centres to continue to use TAC as the primary means of exchange for observations. It encouraged the developed centres to continue to assist those less developed centres in the migration to ensure no degradation to their services by converting between TAC and TDCF when required.

Other implementation coordination and support activities

Severe Weather Forecasting and Disaster Risk Reduction Demonstration Project (SWFDDP)

4.5.18 The Association expressed its appreciation to New Zealand and other contributors to the success of the Severe Weather Forecasting and Disaster Risk Reduction Demonstration

Project (SWFDDP) now underway as a trial in the Region. It noted that this project incurs additional demands on the communications infrastructure of the Region, and that further expansion of the trial and the expansion of the product set, specifically products from Météo-France's high resolution spectral model, reinforces the need for robust communications infrastructure.

IGDDS development and implementation

5.4.19 The Association acknowledged the distribution of space-based data and products in near real-time through Digital Video Broadcast (DVB) systems within the Integrated Global Data Dissemination Service (IGDDS), as an essential operational component of the WIS architecture. It expressed its appreciation to CMA, JMA and NOAA that provide services over the Region and efficient access to a wide-range of satellite data and products, as well as to non-satellite data and products from several WMO Members. The Association stressed the need to ensure end-to-end robustness of these systems and recalled the complementary role in this respect of the GTS and of the Internet to meet the various operational and other needs. It highlighted the need to adopt the WIS metadata standards in order to ensure full inter-operability within the WIS and the GEOSS. The Association further noted that the DVB-S dissemination means, promoted through IGDDS, had the potential to serve a wide range of applications and welcomed the expansion of this concept to other Societal Benefit Areas through the GeoNetCast initiative. It further noted the contribution of Members supporting the Regional ATOVS Retransmission Services (RARS) which make a significant contribution to the improvement of Numerical Weather Prediction to the otherwise data sparse areas of RA V.

4.5.20 The Association endorsed the reports of the chairs of the WG-PIW and its sub-group of ISS that noted the future potential role of using commercial satellite services to supplement the existing distribution systems of the RMTN, in particular if the NOAA GOES 7 satellite, which is nearing the end of its life, fails.

Operational Information Service (OIS)

4.5.21 The Association noted that the operational information is posted on the WMO server under <http://www.wmo.int/pages/prog/www/ois/ois-home.html>. The document "[Best practices for the management of the operational information](#)" available from this Web page provides information on why, when and how to update the operational information, and how to be kept informed of the updating of the operational information. The Association emphasized that the overall efficiency of the OIS is dependent on the prompt notification of changes and updated information from NMHSs. It urged NMHSs to ensure that all changes will reach the WMC/RTH Melbourne (Vol. C1) and the Secretariat without delay, and thus benefit from the improved OIS for access to the up-to-date information required for operations.

Climate Data Management and Exchange

Interfacing Climate Data Management System with WIS

4.5.22 The Association was pleased to note that WMO is promoting and facilitating the interfacing of Climate Data Management Systems (CDMSs) with WIS. This should enable NMHSs to achieve inter-operable interface for climate data access and retrieval through WIS. The Association was pleased to note the increased collaboration between Members in and outside the Region for the provision of modern CDMSs and their installation by NMHSs. This should allow NMHSs to benefit from the increased capacity and functionalities of modern data management technology, allowing better climate data management and services.

Data Rescue and Digitization of Climate Records

4.5.23 The Association reiterated the importance of the WMO Data Rescue (DARE) project in safeguarding, digitizing and making available historical climate archives for the benefit of the Members in the Region, as well as globally. It called on all Members to continue their efforts in accelerating the digitization process of old climate records. In addition, the Association encouraged future Regional Climate Centres (RCCs) to provide, where acceptable to Members, an alternative secure database system for duplication of Members' data as recommended by CCI. The Association took note with appreciation of the progress in rescuing and digitizing historical climate records in the Region.

Towards a high quality global climate data management system

4.5.24 The Association appreciated the strong collaboration amongst the Members in the Region for implementing the World Climate Data and Monitoring Programme with reference to its Climate Data Management component. The Association further concurred with the conclusions of CCI on the future work on CDMSs including the following main activities:

- (a) Provide further guidance on CDMSs to help the providers of these systems to describe them adequately and the potential users to make an informed choice of the CDMSs;
- (b) Produce a minimum set of functions a CDMS should offer based on a new evaluation of the existing and future CDMSs;
- (c) To conduct a comprehensive survey on the degree of operational use of the already installed CDMSs in the developing and Least Developed Countries (LDCs) which benefited from the various capacity building mechanisms, e.g., training workshops, bilateral collaboration and the WMO Voluntary Cooperation Programme (VCP). The result of the survey should lead to revisit the ongoing capacity building strategy to ensure that the CDMS implementation should have a positive impact on producing CLIMAT, and their exchange, in addition to the improved historical data digitization in the countries.

4.5.25 The Association urged Members to further increase their efforts in implementing modern technology and inter-operable systems for climate data management and urged the Members and the Secretariat to continue to provide support to the developing and LDCs and Small Island Developing States (SIDS) to implement and use modern CDMSs.

4.5.26 The Association noted with satisfaction the pro-active approach taken by CCI during its fifteenth sessions, Antalya, Turkey, in February 2010 with regard to climate data management. The Association concurred with CCI recommendations to consider climate data issue within the "UN Delivering as One" concept, bring the climate data issue to the attention of the UN General Assembly and to organize, under the auspices of WMO, an international conference addressing the various aspects of climate data involving a wide participation of technical commissions, WMO Programmes and co-sponsored programmes, as well as partners. The conference should lead to the development of a High Quality Global Climate Data Management System (HQ-GCDMS) which would benefit from the progress made in implementing modern CDMSs and Climate Data Rescue; the set up of WIS architecture; and the utilization of international standards for data representation, exchange and data base models.

Discontinuation of CLIMAT TEMP reports

4.5.27 The Association took note of the CCI decision (Resolution 9.1/1 (CCI-XV)) to agree with the conclusion of the GCOS-AOPC to discontinue the provision and dissemination of CLIMAT

TEMP reports. The decision was based on the result of the CCI/Secretariat questionnaire, sent to all Members, to assess the impacts of a possible discontinuation of CLIMAT TEMP on other domains as requested by EC-LX. The CCI assessment concluded with an overwhelming majority of responses agreeing on the discontinuation of the provision, dissemination and international exchange of CLIMAT TEMP reports. The Association further noted that the discontinuation of CLIMAT TEMP should not affect in any way the provision, dissemination, monitoring and exchange of the daily upper-air TEMP reports, nor the monthly surface CLIMAT reports which remain critical and essential for WWW, GCOS and WCP.

Coordination with related international projects (GEOSS)

4.5.28 The Association concurred with the Executive Council in emphasizing the important role WIS has to play as a WMO core contribution to the GEOSS. It noted the mutual benefits made available by the inter-operability arrangements common to WIS and GEOSS, enabling WMO Members to have access to other GEO data and products, while facilitating the further distribution of weather, climate and water data.

4.5.29 In particular, the Association noted the report of the Subgroup on ISS. Given the geographic extent of the Region and its inequality of terrestrial communications infrastructure, and the availability of commercial satellite bandwidth, the report asserts that a regional satellite broadcast service is now seen as a viable option for servicing the Region. It noted that there is the potential for the GEONETCAST Americas broadcast to be expanded to cover the large gap over the Pacific between GEONETCAST broadcasts by CMA (Asia) and NOAA (the Americas). It also noted that any efforts to establish a Pacific GEONETCAST service would require increased Pacific Island participation in the GEOSS framework.

World Meteorological Organization

XV-RA V/Rep. 4.5

**REGIONAL ASSOCIATION V
(SOUTH-WEST PACIFIC)**

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Expected Result 5

DEVELOPMENT AND IMPLEMENTATION OF THE NEW WMO INFORMATION SYSTEM

Strategic Thrust 1: Science and Technology Development and Implementation

PROGRESS/ACTIVITY REPORT

SUMMARY

Reference: XV-RA V/Doc. 4.5

CONTENT OF DOCUMENT:

Appendix:

- Progress/Activity Report

PROGRESS/ACTIVITY REPORT

1. WIS development and implementation strategy

1.1 The WMO Information System implementation is being undertaken in two parallel parts: Part A concerns the continued improvement of the GTS as evidenced by the work of RA V with the recent migration to MPLS between a number of centres. Part B relates to the new functionality of WIS, including, in particular, the Discovery, Access and Retrieval (DAR) and the associated use of metadata. Thirty-eight WMO Members and two organizations have identified over 100 potential Data Collection or Production Centres (DCPCs) and 13 potential Global Information System Centres (GISCs) across the globe. Within RA V there is one GISC candidate (WMC Melbourne) and there are seven DCPC candidates.

2. Status of implementation of RTHs, NMCs, MTN, inter-regional and regional links

2.1 New Zealand is currently installing a new message switch facility at its Wellington headquarters. The new system provides core RTH functionality, and will also include a module for conversion of TAC to and from TCDF.

2.2 Details of the network topology are diagrammed in Figure 1.

3. Status of implementation of data-distribution systems via satellite and radio-broadcasts

3.1 Details of the implementation of telecommunication systems via satellite and radiobroadcasts are included in Figure 2.

3.2 The variation in communications capabilities across RA V is evident in the role that e-mail and Digital HF radio continue to play in the Pacific as the primary means for the collection and distribution of observations. Other technologies such as SMS via mobile telephony and the RANET component known as Chatty Beetle (which utilizes the Iridium satellite's Short Message Burst protocol) have been developed, specifically in delivering warnings out into the community where communications infrastructure is limited. FM radio also plays an important role in this respect, particularly in Chuuk, Majuro, Niue, Tuvalu and Vanuatu.

4. Review of the exchange of observational data and products

4.1 Monitoring of the WWW has noted an improvement in SYNOP and TEMP availability from the Region. Recent issues in the availability and distribution of CLIMAT reports from some centres have yet to be resolved, but WMC Melbourne and RTH Wellington are going to be working with the centres concerned to address deficiencies.

4.2 A recent achievement is the completion of the Australian Tsunami Warning Service (ATWS) network under an IOC/WMO agreement utilizing the GTS. It is noted that under this agreement the GTS will play a core role in the collection and distribution of sea level observations and products, and related information for tsunami warning services in general.

5. Implementation plan for the further development of the Regional Meteorological Telecommunication Network

5.1 Following the successful move to MPLS so far within the Region, consideration is now being given to bringing other centres onto MPLS, providing such transitions are economically and technically viable. A Manila - Singapore MPLS link is in place but its operational implementation has yet to be completed. The establishment of a Manila – Melbourne link as an operational circuit has been proposed by Manila. There is good reason to recommend this, as delays in implementing the Singapore - Manila link has left Manila vulnerable, with just one operational circuit out of the Region (Tokyo).

5.2 Melbourne, Nadi and Noumea are also investigating moving their links to MPLS via SingTel. Similarly, the US NWS is planning to connect American Samoa to NOAANet by the end of 2010. In parallel, consultation has begun aiming to strengthen the communication link between Samoa and American Samoa. Two centres, Tokelau and Dili, still do not have a connection to the GTS. Tokelau and Samoa are discussing strategies for future improvements. Australia has three HF systems earmarked for Tokelau but, due to the limited availability of the necessary technical staff and distance from Tokelau, these have yet to be delivered.

5.3 Given the geographic extent of the Region, its inequality of terrestrial communications infrastructure, and the availability of commercial satellite bandwidth, a regional satellite broadcast service is now seen as a viable option for servicing the Region. Given that there is a large gap between GEONETCAST broadcasts by CMA (Asia) and NOAA (the Americas), there is the potential for the GEONETCAST Americas broadcast to be expanded to cover the Pacific.

5.4 A GEOSS workshop held in Honolulu in November 2009 noted that any efforts to establish a Pacific GEONETCAST service would be facilitated by an increase in Pacific Island participation in the GEOSS framework. More Pacific Island states should be encouraged to join GEO.

5.5 The Region's satellite services are also vulnerable to the potential impact of a failure of GOES-7 (Pacific Ocean GOES) which is supporting PEACESAT, GEOSS and EMWIN. The spacecraft is nearing the end of its life and alternatives are now being sought. In particular, PEACESAT is looking at commercial satellite opportunities to replace GOES-7. Commercial satellite providers now have a number of options of Pacific-wide services, and it has been demonstrated that a commercial satellite communication and distribution is possible across the whole Pacific basin. The status of the MTSAT programme must not be overlooked, in particular the planned removal of Direct Broadcast from MTSAT post 2015, and migration to distribution via Internet. Despite the FENGYUNCast broadcast being restricted to images, there is potential for widening this capability to contribute to filling the gaps in the Pacific, through GEONETCAST, in addition to other Pacific opportunities.

Data communication techniques and procedures

5.6 The Region is making extensive use of TCP/IP procedures and has implemented cloud-based services. Centres will continue to upgrade services as more communications providers upgrade their infrastructure. The use of mobile networks within countries has resulted from expanded mobile phone services. It is expected that the regional SMS expansion will continue to take advantage of these for distribution of warnings. Capacity building remains a critical element to the delivery of better services including the need to undertake activities such as train the trainer to take advantage of distance learning as offered by PEACESAT.

Operational procedures

5.7 Centres in the Region should be looking to their associated RTH for assistance with GTS matters, including management of bulletin duplication, message routing, and the allocation of abbreviated headers for new data types and products. In addition, the implementation of WIS should be driven through the RTHs, especially regarding guidance on how to implement the new functionality of WIS: DAR and its related metadata.

6. Other information systems and services issues

Migration to table-driven code forms

6.1 The timelines for migration to TDCF are provided in Table 1. The Rapporteur on Migration to TDCF has reported positive progress on migration at a number of centres. It was reported that the Wellington Message Switch Upgrade, presently in pre-operational mode, would facilitate code migration for a number of centres within its area of responsibility. However, it is important to note that complete migration to TDCF depends on forecasting tools, such as Digital Atmosphere used in smaller centres, being upgraded to support TDCF. It also noted that dependence on HF email and SMS prompts centres to continue to use TAC as the primary means of exchange for observations.

7. Coordination support activities

7.1 A number of centres within RA V continue to collaborate with centres in RA II on the development of VPN technologies, procedures and services under WIS. The VPN project is now in the advanced stage, with supporting applications for collecting and displaying information. The project remains a valuable contributor to WIS, and more centres are encouraged to participate as their resources allow.

7.2 There is also potential for future discussions between RA II and RA V on the GISC to GISC relationships including consideration of backup arrangements for the RA V candidate GISC (WMC Melbourne) by Tokyo/Beijing or Washington.

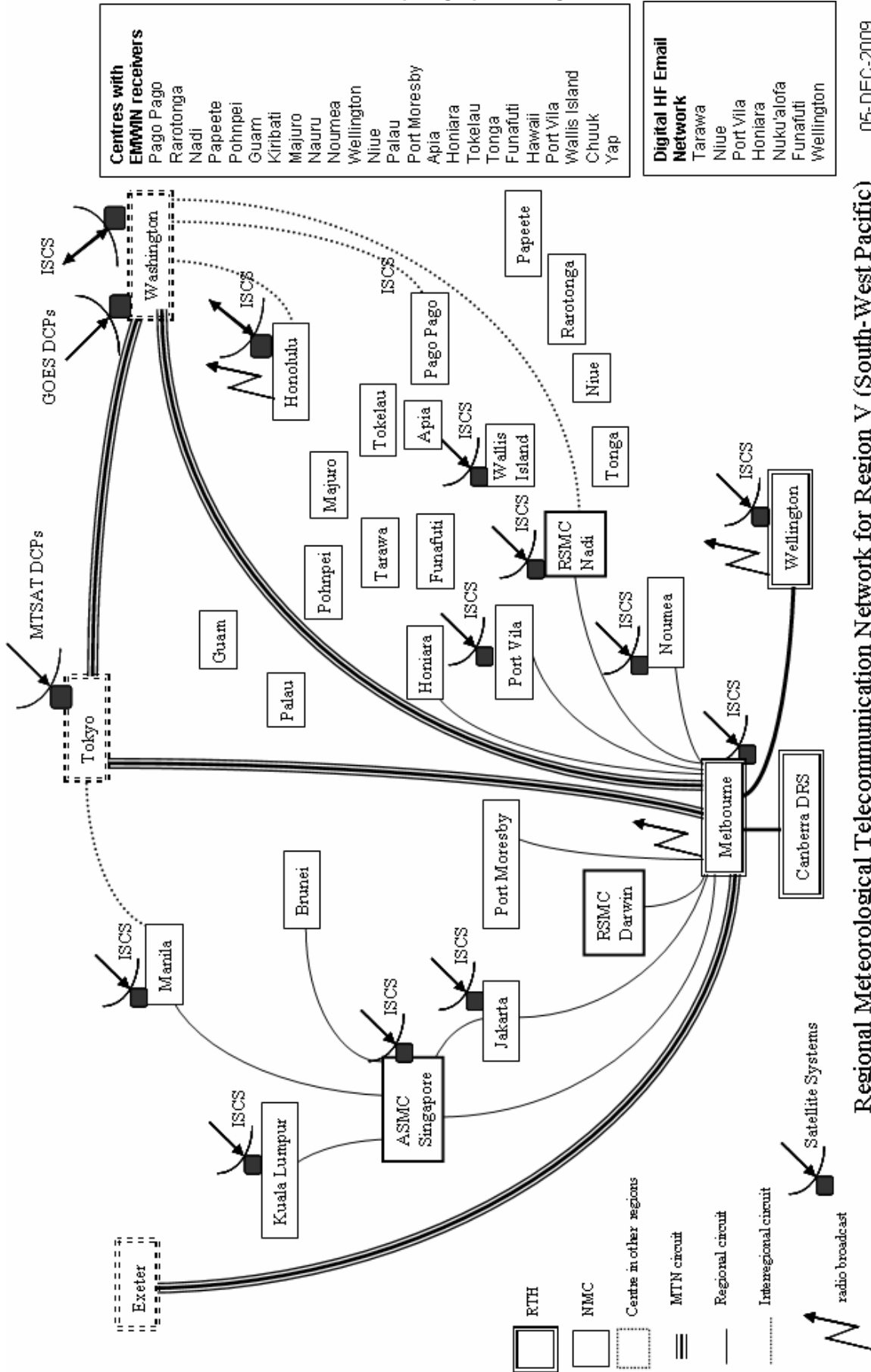
8. Proposed future working arrangements and issues under WMO strategic plan

8.1 The future working group structure aligned to the regional strategic plan, should be considered with a strong focus on WIS and WIGOS. Given the existing challenges of communications, there remains a need to pay special attention to the unique communication technology issues in RA V.

8.2 The Severe Weather Forecasting and Disaster Risk Reduction Demonstration Project (SWFDDP), now underway as a trial in the Region, places additional demands on the communications infrastructure of the Region. It has been recognized that further expansion of the trial and the expansion of the product set, specifically products from Météo-France's high resolution spectral model, reinforce the need for robust communications infrastructure. A Pacific GEONETCAST service could have a role in providing the required products to the Region and enhancing the SWFDDP principles.

8.3 Timor Leste has become the 22nd Member of RA V, and the 189th Member of WMO as of 4 December 2009. This entails a need to ensure Dili becomes connected to the GTS as soon as practicable.

Annex to paragraph 3.1, Figure 2



Regional Meteorological Telecommunication Network for Region V (South-West Pacific)

Implementation of telecommunication systems via satellite and radiobroadcasts

Annex to paragraph 6.1, Table 1

TDCF MIGRATION MATRIX

Category of traditional Alphanumeric Codes (TAC)	Nov. 2005	Nov. 2006	Nov. 2007	Nov. 2008	Nov. 2009	Nov. 2010	Nov. 2011	Nov. 2012	Nov. 2013	Nov. 2014	Nov. 2015	Nov. 2016
Cat.1: Common SYNOP, TEMP, PILOT, CLIMAT	Start operational exchange						Migration complete					
Cat.2: Satellite observations SARAD, SAREP, SATEM, SATOB	Migration complete											
Cat.3: Aviation METAR, SPECI, TAF AMDAR	Migration complete		Start experimental exchange						Start operational exchange			
Cat.4: Maritime BUOY, TRACKOB, BATHY, TESAC, WAVEOB, SHIP, CLIMAT SHIP, PILOT SHIP, TEMP SHIP, CLIMAT TEMP SHIP	Start experimental exchange		Start operational exchange						Migration complete			
Argos data	Migration complete		Migration complete						Migration complete			
Cat.5: Miscellaneous RADOB, IAC, IAC FLEET, GRID, RADOB	Start operational exchange		Migration complete									
Cat.6: Obsolete ICEAN, GRAF, NACLI etc., SFAZI, SFLOC, SFAZU, ROCOB, ROCOB SHIP, CODAR, WINTEM, ARFOR, RADREP, MAFOR, HYDRA, HYFOR NOT APPLICABLE												

NOTES:

- (1) Aviation Codes require ICAO coordination and approval, except for AMDAR.
- (2) SAREP and RADOB require coordination by the ESCAP/WMO Typhoon Committee.
- (3) For category 5, codes need to be reviewed in order to decide whether or not they should be migrated to BUFR/CREX.
- (4) Codes in category 6 are not to be migrated.
- (5) All dates above are meant as "not later than". However, Members and organizations are encouraged to start experimental exchange, and, if all relevant conditions (see below) are satisfied, to start operational exchange as soon as possible.

- **Start of experimental exchange** means: data will be made available in BUFR (CREX) but not operationally, i.e. in addition to the current alphanumeric codes, which are still operational.
- **Start of operational exchange** means: data will be made available in BUFR (CREX) whereby some (but not all) Members rely on them operationally. Still the current alphanumeric codes will be distributed (parallel distribution).
- **Migration complete** means: at this date the BUFR (CREX) exchange becomes the standard WMO practice. Parallel distribution is terminated. For archiving purposes and at places where BUFR (CREX) exchange still causes problems the alphanumeric codes may be used on a local basis only.

Relevant conditions to be satisfied before experimental exchange may start:

- Corresponding BUFR/CREX-tables and templates are available;
- Training of concerned testing parties has been completed;
- Required software of testing parties (encoding, decoding, and viewing) is implemented.

Relevant conditions to be satisfied before operational exchange may start:

- Corresponding BUFR/CREX-tables and templates are fully validated;
- Training of all concerned parties has been completed;
- All required software (encoding, decoding, viewing) is operational.