REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC)

TENTH SESSION OF THE RA V MANAGEMENT GROUP

JAKARTA, 14 TO 15 MARCH 2014

FINAL REPORT

WORLD METEOROLOGICAL ORGANIZATION

TENTH SESSION OF THE RA V MANAGEMENT GROUP
(Jakarta, Indonesia, 14 to 15 March 2014)

1. ORGANIZATION OF THE SESSION (*agenda item 1*)

1.1 The tenth session of the RA V Management Group (MG-10) was held at Main Building of the Agency for Meteorology, Climatology and Geophysics of the Republic of Indonesia (BMKG) in Jakarta from Friday, 14 March to Saturday, 15 March 2014. The list of participants is given in Annex I to this report.

1.2 Dr Sri Woro B. Harijono, president of RA V, opened the session at 10:00 hours on 14 March 2014. In her opening remarks, the president expressed her appreciation to WMO Secretariat for the support provided during her term as president of RA V. The president extended a warm welcome to all participants and thanked the members for accepting her invitation to attend the session. She also thanked the WMO Secretariat for the arrangements made for this session. Dr Harijono highlighted the importance of MG-10 session to discuss the preparation of the sixteenth session of RA V (RA V-16), future activities of RA V, review of the location of the Regional Office for Asia and the South-West Pacific (RAP Office), and the increase of the number of the RA V seats in the Executive Council (EC).

1.3 Dr Andi E. Sakya, Chair of the Agency for Meteorology, Climatology and Geophysics (BMKG) on behalf of his portfolio as the new Chairman of BMKG in his welcoming speech warmly welcomed the participants to BMKG Headquarters. MG-10 would not be successful without strong initiatives and decisive arrangements from WMO, RA V Management Group and BMKG, and joined the president of RA V expressing sincere appreciation to them for the arrangements of MG-10 to be held in BMKG premises. He invited the participants to visit BMKG facilities such as the Tsunami Early Warning System (TEWS), the Meteorological Early Warning System (MEWS) and the Climate Early Warning System (CEWS). He concluded by wishing the participants a successful meeting and a pleasant stay in Jakarta.

1.4 The Management Group reviewed and approved the agenda for MG-10 as given in Annex II.

1.5 The Group was informed that documents for the session are available at the WMO website: www.wmo.int/pages/mediacentre/news/RAV_MG10.html.

2. MATTERS ARISING FROM THE NINTH SESSION (*agenda item 2*)

2.1. The Management Group reviewed the final report of the ninth session of RA V Management Group (MG-9) (Geneva, 15 May 2013) which focused on the preparation for the RA V-16 which will be held in Jakarta, Indonesia from 2 to 8 May 2014; future activities of RA V; the potential re-location of RAP Office; and the number of RA V seats in EC. With the agreement of the Group, the president approved the report of MG-9, which can be accessed at the WMO website www.wmo.int/pages/prog/dra/rap/documents/FinalReport-RAVMG9.pdf.

3. REVIEW OF THE ACTIVITIES OF RA V SUBSIDIARY BODIES (*agenda item 3*)

Working Group on Infrastructure

3.1. The Group noted the report of the Working Group on Infrastructure (WG-INFR) as given in Annex III.

3.2. The Group was informed of some of the lessons learnt by WG-INFR, as summarized below.

(a) It is challenging to keep the Task Teams engaged and productive if there are too many of them.

(b) Some Task Teams had major overlap in membership and they could operate better by merging some of them into one Task Team and have it to perform more than one tasks. Good examples to combine the Task Team on Pacific Satellite Communications with the Task Team on Satellite User Requirements, and the Task Team on WIS with the Task Team Table Driven Code Forms.

(c) Regardless of the priorities of WMO and its Members, Working Groups and Task Teams activities could only be implemented if relevant experts are available. Some suggestions regarding experts would be for WMO to issue the call for nominations as early as possible and support it with as much information as possible, seek representation from many Members, seek experts who also have a (past, present or prospective future) link to relevant Technical Commissions, and to support face-to-face meetings early in the life of Working Groups or Task Teams.

(d) Some activities of Task Teams need to be ongoing rather than time-bound task such as monitoring the implementation of networks.

3.3. The Group requested Mr Russell Stringer (Australia), Lead of WG-INFR to identify specific deliverables and activities for each of the Key Outcome of RA V Strategic Operating Plan (SOP) 2012-2105 and submit them to the Secretariat, for further discussion at the RA V-16. The Group also inquired if WG-INFR had put in place a monitoring and evaluation of its activities.

3.4. The Group expressed its appreciation to Mr Stringer for the leadership of the WG-INFR, and it thanked the members of WG-INFR and Task Teams for the works conducted and results achieved.

Tropical Cyclone Committee

3.5. The Group noted the report of the Tropical Cyclone Committee for the South Pacific and South-East Indian Ocean (TCC) as given in Annex IV.

3.6. The Group was reminded especially by Indonesia of, and requested to provide update on, RA V-15 decision on the Severe Weather Forecast Demonstration Project (SWFDP) related to extending the Regional Specialized Meteorological Centers (RSMC) operation guidance area to a new ”western window” and a setting up of a guidance area north of the equator to be examined. The Group considered these as interesting ideas and it is keen to see these implemented. The Group also noted that the Regional Subproject Management Team (RSMT) for the Severe Weather Forecast and Disaster Risk Reduction Demonstration Project (SWFDDP) for the South Pacific recognized that with the current implementation of SWFDDP it would be challenging to expand it in terms of the effectiveness of severe weather forecast under current demonstration phase, governance, and transition from a demonstration phase to an operational phase. The Group noted Indonesia requested to extend RSMC operation guidance area to a new ”western window” and a setting up of a guidance area north of the equator.

3.7. The Group noted that including all Members of RA V and incorporating disaster risk reduction, services delivery, severe weather forecasts, storm surges and coastal inundation into TCC portfolio would present a challenge as TCC membership is confined to RA V Members in the Southern Hemisphere, and RA V Members in the Northern Hemisphere are members of the Typhoon Committee. To address this and to cater for all Members of RA V, the Group requested

TCC to include in its agenda and to discuss other issues such as disaster risk reduction, services delivery, severe weather forecasts, storm surges and coastal inundation.

3.8. The Group requested Mr Mike Bergin (Australia), Chair of TCC to identify specific deliverables and activities for each of the Key Outcome of RA V SOP 2012-2105 and submit them to the Secretariat, for further discussion at the RA V-16.

3.9. The Group expressed its appreciation to Mr Bergin for the leadership of TCC, and it thanked the members of TCC for the works conducted and results achieved.

Working Group on Weather Services

3.10. The Group noted the report of the Working Group on Weather Services (WG-WXS) as given in Annex V.

3.11. The Group noted that Indonesia requested for continued training and implementation of competency assessment for forecasters and observers to comply with the International Civil Aviation Organization (ICAO) Annex 3 to the Convention of International Civil Aviation, and to expand training on quality management including internal quality management auditor, competency assessment to other Members of RA V.

3.12. The Group was informed that a lead quality management auditor training organized for staff of Pacific Islands NMHSs who had gone through basic training and practices in internal quality management auditing, to be held in Nadi, Fiji from 28 April to 2 May 2014. The Group also noted Indonesia's request to extend the invitation to other Members of RAV.

3.13. The Group noted the concern raised by Indonesia with respect to delays in issuing SIGMET due to receiving late information from the Volcanic Ash Centre (VAC) in Darwin, Australia. In response, the Group informed Indonesia that SIGMET on volcanoes could be issued when needed without having to wait for advisories or other information from VAC in Darwin. It would be always useful for Indonesia to send information on volcanoes to VAC Darwin.

3.14. The Group was informed that ICAO would be reluctant to set up new and additional VAC. ICAO would prefer to reduce than increase number of VAC.

3.15. The Group requested Ms Sue O'Rourke (Australia), Lead of WG-WXS to identify specific deliverables and activities for each of the Key Outcome of RA V SOP 2012-2105 and submit them to the Secretariat, for further discussion at the RA V-16.

3.16. The Group expressed its appreciation to Ms O'Rourke for the leadership of WG-WXS, and it thanked the members of WG-WXS for the works conducted and results achieved.

Working Group on Climate Services

3.17. The Group noted the report of the Working Group on Climate Services (WG-CLS) as given in Annex VI.

3.18. The Group was informed of some of the lessons learnt by WG-INFR including limited number of experts, very limited number of meetings, missing information on members, low participation and commitment of members in WG-CLS activities.

3.19. The Group noted that the establishment of Regional Climate Centers (RCCs) would be either via a physical RCC or as a consortium of institutions, each performing certain function of a RCC, would be very important the implementation of the Global Framework for Climate Services (GFCS). The Group also noted that Indonesia offered to host RCC mandatory tasks.

3.20. The Group was informed that Australia contributed funds to the GFCS, to develop a physical of a consortium or RCC in the Pacific region.

3.21. The Group was also informed of the Regional Consultation Workshop on Climate Services in the Pacific States, which was planned to be held in Rarotonga, Cook Islands, from 30 March to 4 April 2014. The Group noted the request from Indonesia to extend the invitation for the workshop to other Members of RA V.

Working Group on Hydrological Services

3.22. The Group noted the report of the Working Group on Hydrological Services (WG-HYS) as given in Annex VII including activities implemented during the past years, training in hydrology data in September 2014, preparing distance learning course materials for hydrology, and preparation of budget and programme for RCWR/RTC – Hydrology and climatology.

3.23. The Group noted that WG-HYS had not been active and it would need improvement and special attention.

3.24. The Group concluded discussions on the Working Groups by noting that experts involved in the Working Groups should also be involved in the Technical Commissions and vice-versa.

4. DEVELOPMENT OF RA V STRATEGIC OPERATING PLAN (SOP) 2012-2015 AND SOP 2016-2019 (*agenda item 4*)

WMO Operating Plan 2016-2019

4.1. The Group was informed of the process of preparing the WMO Operating Plan (OP) 2016-2019 including the structure, vision, strategic priorities. The Group was also reminded of Congress and Executive Council decisions, expectation from Regional Association and timelines relating to the development, finalization and approval of the Plan. The WMO Result-Based Budget (RBB) for 2016-2010 which is based on WMO Strategy Plan (SP) and OP 2016-2019 will be submitted to the EC-66 in June 2014; the Executive Council would review the WMO SP and OP and then present them to the seventeenth Congress (Cg-17) in 2015; and the Regional Associations are expected to coordinate national contributions, provide regional needs and priorities, and develop their own OPs.

4.2. The Group was reminded of the Secretariat letter ref: SG/ASG/SPO/RAs_TAs-OP2016-2019 which was dated 4 March 2014, requesting presidents of Regional Associations and Technical Commissions to provide inputs to the planning process of WMO OP 2016-2019. A copy of the letter is given in Annex VIII. The Group was advised to respond to the Secretariat letter, and to have further discussions on this during the RECO-6 and the RA V-16.

RA V Operating Plan 2016-2019

4.3. The Group recommended to start developing RA V Operating Plan 2016-2019 and to have further discussion on it during the RECO-6 and the RA V-16 which are planned to be held in Jakarta, Indonesia, from 31 April to 8 May 2014. The Group requested the Chair of RA V Task Team on Strategic and Operating Planning (TT-SOP) to prepare a draft RA V SOP 2016-2019 for further discussion during the RECO-6 and the RA V-16.

RA V Strategy Operating Plan 2012-2015

4.4. The Group was briefed on the previous MG decisions relating to the development and implementation of RA V SOP 2012-2015. The Group noted that the RA V-16 would provide an opportunity to complete the deliverables and activities of RA V SOP 2012-2015, and requested the Chair of the RA V TT-SOP to prepare the draft list of deliverables and activities for RA V SOP 2012-2015 for the submission to the session.

4.5. The Group was informed of the Executive Council Working Group on Strategy Operating Plan (EC-WG/SOP) discussion on developing a broad and flexible roles and responsibilities of Regional Associations which might lead to amendment of General Regulation 162. This could also allow the Regional Associations to implement their Plans. A copy of the discussion document is given in Annex IX.

5. REVIEW OF THE DRAFT RA V IMPLEMENTATION PLANS OF WIGOS AND WIS (*agenda item 5*)

Draft RA V Regional Implementation of WIGOS (R-WIP-V)

5.1. On behalf on Mr Russell Stringer, Mr Jon Gill presented the Draft R-WIP-V, as given in Annex X, to the Management Group.

5.2. The Group expressed its appreciation to Mr R. Stringer (Australia), Lead of the Working Group on Infrastructure (WG-INFR) and also the Coordinator of the Task Team on WIGOS Interpretation and Opportunities (TT-WIGOS) for the leadership and the excellent works carried out to produce the R-WIP-V current version 0.9 (30/08/2013). The Group also thanked the members of the WG-INFR and the TT-WIGOS, and the Secretariat for their support and contributions to the accomplishment of this task. The Group endorsed the R-WIP-V current version 0.9 (30/08/2013) and agreed for the submission to the RA V-16 for further discussion.

5.3. The Group proposed that a presentation on R-WIP-V be made to the RA V-16 session; the R-WIP-V be reviewed and the updated/changes be used to develop a new version 2; attention be given to adding more guidance in R-WIP-V about the relative priority of each action and its feasibility (particular with regards to the resources needed); draft update of the R-WIP-V could be developed based on the discussions held at RECO-6, then presented to the RA V-16 for consideration.

Draft RA V Regional Implementation Plan of WIS (RA V WIS-IP)

5.4. On behalf on Mr Russell Stringer, Mr Jon Gill presented the Draft RA V WIS-IP, as given in Annex XI, to the Management Group.

5.5. The Management Group expressed its appreciation to Mr R. Stringer (Australia), Lead of the WG-INFR and Dr W. Qu (Australia), Theme Leader for the Task Team on Regional Implementation Strategy for new WIS Discovery and Retrieval Services (TT-DAR) for their leadership and the excellent works carried out to produce the RA V WIS-IP current version RA V WIS Implementation Plan –V0.5 February 2014. The Group also thanked the members of the WG-INFR and TT-DAR, and the Secretariat for their support and contributions to the accomplishment of this task. The Group, after reviewing the RA V WIS-IP V0.5, agreed on the submission to the RA V-16 for further discussion and improvements.

6. ORGANIZATION OF THE SIXTH REGIONAL CONFERENCE ON MANAGEMENT OF METEOROLOGICAL AND HYDROLOGICAL SERVICES IN RA V (RECO-6) (*agenda item 6*)

6.1. Preparation of RECO-6 including concept note, provisional programme and work plan *(agenda item 6.1)***.**

6.1.1. The Management Group reviewed and endorsed the concept note, provisional annotated programme, nomination form, information note for participants, work plan, and provisional agenda for RECO-6 as given in Annex XII.

6.2. Review of the Outcomes of the Survey Questionnaire on Challenges and Priorities in RA V and Contribution to the WMO Operating Plan 2016-2019 *(agenda item 6.2)*

6.2.1. The Management Group noted that the survey had been conducted in January-February 2014 using Survey Monkey platform and nineteen Members among twenty-three RA V Members responded. The Group expressed its appreciation to the president of RA V and Mr J.Gill (Australia), Chair of RA V Task Team on Strategic and Operating Plan for the initiative to conduct a survey on challenges and future priorities in Region V. The Group also expressed its appreciation to the Secretariat for the support provided to accomplish the survey. The Group was pleased to note the active participation of the Members in the survey in such a short period of time.

6.2.2. The Management Group was informed of the survey analysis conducted in five categories: (a) institutional arrangements; (b) management and organization; (c) operations and services; (d) challenges and priorities; and (e) expected outcomes from the RA V-16, and note that the survey analysis also provided comparative analyses among three sub-groups: Pacific Island Countries and Territories (PICT), South East Asia (SEA) and other Members.

6.2.3. The Management Group noted that the survey identified (a) lack of qualified personnel; (b) NWP modeling capacity; (c) observing systems; and (d) EWS services for DRR, among others, as the main challenges in RA V, and similarly, the survey identified priorities in the Region as follows:

(a) Implementation of WIGOS/WIS;
(b) Capacity Building;
(c) PWS, DRR/EWS, and Aviation Services;
(d) Climate Services including GFCS implementation;
(e) Quality Management System (QMS) Implementation.

6.2.4. The Management Group noted in the outcomes of the survey that during the RA V-16, the Members wish to discuss existing economic constraints, data policy, and the relationship between private and public sectors, and to determine clear priorities for the next intersessional period and agree on concrete actions for their realization, and also the Members expect outcomes from the RA V-16 including strengthening of regional cooperation and the preparation of agreed strategic plan to guide the work of RA V for the next 4 years and a clear articulation of a small number of high priority work areas.

6.3. Recommendation on the Contributions of RA V to the SIDS Conference (*agenda item 6.3***)**

6.3.1. The Management Group noted that the Third International Conference on Small Island Developing States (SIDS) will be held from 1 to 4 September 2014, preceded by activities related to the Conference from 28 to 30 August 2014 in Apia, Samoa. The theme for the 2014 Conference is *"SIDS Sustainable Development Through Genuine and Durable Partnership"*. The Conference will serve as a forum to build on existing successful partnerships as well as to launch innovative and concrete new ones, to advance the sustainable development of SIDS. The Conference will include six multi-stakeholders partnership dialogues, held parallel with the plenary meetings. The multi-stakeholders partnerships include the followings:

(a) Climate change and sustainable energy.
(b) Oceans and seas.
(c) Sustainable tourism.
(d) Disaster resilience.
(e) Health and non-communicable diseases.

(f) Waste Management.

6.3.2. The Management Group also noted that WMO Partnership (GFCS-SIDS Partnership) is showcased on the SIDS Conference's website (http://www.sids2014.org/index.php?type=66&menu=1507&page=view&nr=789). In addition to this, WMO is mentioned as partner in two additional partnerships.

(a) Joint task force to investigate the potential of using submarine telecommunications cables for oceans and climate monitoring and disasters warnings (http://www.sids2014.org/index.php?type=view&type=1006&nr=2235&menu=1507).
(b) Pacific Meteorological Council (http://www.sids2014.org/index.php?type=view&type=1006&nr=2358&menu=1507).

6.3.3. The Management Group expressed its appreciation to the Secretariat for developing a strategy for engaging WMO and its Members in the Conference process. It requested the Secretariat to inform Members on the progress of WMO preparation for the Conference at the RECO-6 which will be held in Jakarta from 30 April to 1 May 2014.

6.3.4. The Management Group noted the draft WMO Roadmap for Engagement with the Third International Conference on Small Island Developing States and related processes.

7. ORGANIZATION OF THE SIXTEENTH SESSION OF RA V

7.1 Preparation for RA V-16 session *(agenda item 7.1)*

Date and place of the RA V-16 session

7.1.1 The MG-10 was pleased to confirm that the RA V-16 would be held from Friday, 2 May to Thursday, 8 May 2014 (seven days including one-day holiday on Sunday, 4 May 2014), preceded by a two-day Regional Conference on Wednesday, 30 April and Thursday, 1 May 2014 at the Auditorium of the Agency for Meteorology, Climatology and Geophysics (BMKG) in Jakarta, Indonesia.

7.1.2 The Group was informed that Members of WMO were notified, on 10 February 2014, of the date and place of the RA V-16 and were requested to send notification of their intention to be represented at the session to the Secretariat by 10 April 2014. The formal notification letter and an invitation letter are expected to be shortly sent (by mid-March 2014) to Members and non-Members of WMO and international and regional organizations, respectively.

Agenda

7.1.3 The Group noted that the Secretary-General approved the Provisional Agenda, which includes a separate agenda item on the Global Framework for Climate Services (GFCS).

Work Plan

7.1.4 The MG-10 endorsed the revised Tentative Work Plan proposed by the Secretariat in view of the need for discussions on the RA V strategic and operational planning and internal matters of the Association (agenda item 5), GFCS (agenda item 6) and the emerging issues and specific challenges (agenda item 7) at earlier dates.

7.1.5 The Group agreed to include the brief presentation of the activity reports of the subsidiary bodies (MG, Tropical Cyclone Committee and Working Groups) during the intersessional period 2010-2014 in the afternoon of the first day (under agenda item 5.3).

7.1.6 The Group further agreed that all items should be discussed in Plenary meetings, as in the past, with *General Plenary* to be chaired by the president and the vice-president; and *Programme Plenary* to be chaired by Co-Chairs. *Programme Plenary A* items would be: Service quality and service delivery; Disaster risk reduction; and Observation and information systems, and *Programme Plenary B* items would be: Data processing and forecasting; Research; Capacity development; and partnerships. Chairs, Co-Chairs and Secretaries of the Plenaries should facilitate the effective discussions and decisions through the pre-session coordination meeting(s).

7.1.7 Working hours could be 09:00 to 12:00 and 14:00 to 17:00 (six hours per day). Side meetings and ad hoc group meetings can be organized outside the above working hours in English without interpretation.

7.1.8 The Group considered possible side events during the RA V-16. It agreed that some side meetings would be necessary for defining the composition and terms of reference of the new subsidiary bodies of the Association. It also agreed that a videoconference be organized, as a side event, with the WMO Secretariat on the agenda items 4.1, 4.2, 4.3, 4.7 and 6. The Group requested the Secretariat to continue to work for the plan of side events in consultation with the president and vice-president of RA V.

Document preparation

7.1.9 The Group was pleased to note that the WMO mini-website (http://rav-16.wmo.int/) was created for the RA V-16 information and documents. In this connection, the MG-10 further noted that the pre-session and in-session documents would be prepared in English only but the Abridged Final Report of the RA V-16 would be prepared in English and French.

Chair/Co-chairs

7.1.10 The Group considered that *Plenary A* could be co-chaired by Dr R. Vertessy (Austlaria) and *Programme Plenary B* by Mr. A. Waqaicelua (Fiji). The Group suggested that Mr P. Lennox (New Zealand) and Ms Wong Chin Ling (Singapore) be invited to co-chair Plenary A and Plenary B.

Establishment of Committees

7.1.11 The MG-10 agreed that Credential Committee and Drafting Committee will not be established. The Group agreed in principle that the Nomination Committee would be composed of Ms C.G. Ismail (Malaysia: Chair); Mr S. Pulehetoa (Niue) and Mr J. Napat (Vanuatu). Principal delegate of the Philippines would serve as Rapporteur on Review of the previous resolutions and recommendations. The Group noted that the Coordination Committee would consist of the president and vice-president; Co-Chairs; Secretaries of the Plenaries and some Secretariat representatives.

7.1.12 The Group noted that the establishment of a working committee on WIS/GISC would be required to finalize the area of responsibility of each RA V GISC.

Scientific Lectures and Discussions

7.1.13 The Group agreed that two or three scientific lectures for a total of two hours maximum should be considered focusing on WMO/RA V priority areas or emerging issues in the Region. The Group was pleased to note that three possible scientific lectures had been proposed from RA V Members on:

(1) Prospects for Improved Seasonal Forecasting in Southeast Asia (by Dr Chris Gordon, Singapore);

(2) Recent Flash Flood and Landslides Evidences in Manado, North Sulawesi (by **Mr Mulyono Rahadi Prabowo**,Indonesia;
(3) The Benefits of working together in Partnership; pull through Science to Services (by **Mr Paul Davies**, United Kingdom)

7.1.14. The Group recommended that the Secretariat contact other potential candidates from the Members including Philippines and inform the Group of the final candidates for the scientific lecture.

7.2 Subsidiary Bodies of the Association: Future Working Mechanism *(agenda item 7.2)*

7.2.1. The Management Group recommended that:

(a) The Association should continue to play an important and active role in the implementation of WMO Programmes and activities in the Region in the fields of weather, climate and water;

(b) The Association through it future working mechanism should continue to enhance and establish strong linkage with Technical Commissions; and

(c) The future working mechanism of the Association should remain as the current mechanism but it may require some changes to Working Groups' Terms of Reference and the Task Teams, and a few more Task Teams may be added.

7.2.2. The Management Group noted that proposals put forward by some Technical Departments and some of Leads of Working Groups for the future working mechanism of RA V would be summarized as follows:

(a) *Management Group*: To strengthen its mandates to oversee disaster risk reduction and services delivery;

(b) *Tropical Cyclone Committee*: To expand its mandate to other severe weather and related events through a creation of a Task Team on Task Team for Severe Weather Forecasting including Global Data Processing and Forecasting System, and another Task Team for Coastal Inundation including Storm Surges;

(c) *Working Group on Hydrological Services*: To reduce the number of Task Teams from five to 4 and rename them as (i) Task Team for Capacity Building in Hydrology (TT-CBH); (ii) Task Team for Hydrology Database Management (TT-HDM); (iii) Task Team for Disaster Risk Reduction – Water related Disaster; and (iv) Task Team for Water and Climate (TT-CW);

(d) *Working Group on Infrastructure*: The proposals received to date are focusing only on WIS. To keep rename the Task Team on the Regional Implementation Stratgy for new WIS Discovery and Retrieval Services (TT-DAR) with a Task Team on Regional implementation and Operation of WIS (TT-WIS); and to consider the Task Team on Pacific Satellite Communications (TT-PSC) as part of WIS;

(e) Working Group on Climate Services: To ensure continuity and maintain the current structure of the WG-CLS with: (i) Task Team on Climate Information and Prediction Services including Regional Climate Centres (RCCs) and Regional Climate Outlook Forum (RCOF) (TT-CLIPS); (ii) Task Team on Climate Data Management/Data Rescue (TT-CDM); (iii) Task Team on Climate Change (TT-CC); (iv) Task Team on Use of Improved Tools for Operational Agrometeorology including Coping with Impacts of Natural Disasters on Agriculture (TT-ITA); and (v) Task Team on Agrometeorological Information (TT-AIF); and

(f) *Working Group on Weather Services*: To ensure continuity of the WG-WXS to assist in the implementation of robust and effective weather service delivery throughout RA V and maintain with the following modified structure: (i) Task Team on Cost Recovery (TT-CR); (ii) Task Team on Quality Management (TT-QM);(iii) Task Team on Training, Competencies and Qualifications (TT-TRG); and (iv) Task Team on Weather Services Implementation (TT-IMP).

7.2.3. In light of the limited information from the Technical Departments and Working Groups, the future working mechanism including structure could be considered as given in Annex XIII.

7.3 Logistical arrangements *(agenda item 7.3)*

7.3.1 The MG-10 was briefed by Dr Sri Woro B. Harijono, Permanent Representative of Indonesia with WMO and the WMO Secretariat, on the recent progress of logistical arrangements for the RA V-16 session and the Regional Conference (RECO-6).

7.3.2 The MG-10 noted with pleasure that RA V-16/INF. 1 – Material Arrangements for the Session (Information Note for Participants, Annex XIV) was finalized in collaboration with the Local Organizing Committee and was posted on the WMO mini-website (http://rav-16.wmo.int/) on 15 March 2014. The Members were encouraged to make arrangements with BMKG for visa application and hotel reservations.

7.3.3 The Group was pleased to note that arrangements will be made for a poster session during the Regional Conference and space for several booths for exhibition of hydrometeorological instruments and equipment.

7.3.4 The MG-10 requested the Local Organizing Committee to ensure the smooth arrival and transportation arrangements for the participants through setting up of an Information/Help Desk at the arrival area of Soekarno-Hatta International Airport.

8. REGIONAL ACTIVITIES FOR 2014-2015 *(agenda item 8)*

8.1. The Management Group expressed its appreciation to Members who have hosted and co-sponsored regional events and agreed on the proposed events as given in Annex XV

8.2. The Management Group reviewed and agreed on the proposed dates and budget.

9. **REVIEW OF POTENTIAL LOCATION OF THE REGIONAL OFFICE FOR ASIA AND SOUTH-WEST PACIFIC** (*agenda item 9*)

9.1 The Management Group was pleased to note that, at the request of Cg-XVI (Geneva, May 2011), the Secretariat initiated a comprehensive review of resources and location of the Regional Office for Asia and the South-West Pacific, with a special focus on efficient and effective management and operation of the Office.

9.2 The Group also noted that the RA II-15 (Doha, Qatar, December 2012), in considering the pros and cons of the relocation of the Regional Office for the Region, recognized the advantages of the location of the Regional Office being in the Region in particular in terms of cost-effectiveness, and agreed that the president of RA II, in collaboration with the president of RA V, proceed with seeking potential candidates for hosting the Regional Office from all Members of RA II and RA V, so as to make an assessment of the candidates using the regionally agreed criteria.

9.3 The MG-10 further noted that, in response to the WMO circular letter addressed to RA II and RA V Members, some Members (India, Indonesia, Republic of Korea; Singapore; and Qatar)

indicated their Governments' interest in hosting the Regional Office. It expressed its appreciation to Indonesia and Singapore for their generous offer to host the Regional Office.

9.4 The MG-10 recalled that, following the agreement in principle by the RA V MG-8 (Geneva, June/July 2012) and by RA II-15 on the generic criteria for the assessment of appropriate location of the RAP Office in the Regions, the RA II MG-7 and RA V MG-9 (Geneva, May 2013) agreed to further develop regional criteria if any and the possible weight given to specific criteria for selection of the location of the RAP Office from several candidates.

9.5 The Group agreed on the regional criteria, categorized into three groups "Efficiency", "Cost-effectiveness" and "Sustainability and quality of environment" and on the evaluation procedures and methodology.

10. **REPRESENTATION OF RA V IN THE EXECUTIVE COUNCIL** (*agenda item 10*)

10.1. The Management Group recalled its decision at the MG-9 that the president of RA V is required to prepare appropriate proposal for a change in the number of the Executive Council seats, and such proposals would be based on a close communication with the Executive Council Working Group on Strategic and Operational Planning (EC WG/SOP) with the support from the Secretariat.

11. OTHER BUSINESS **(agenda item 11)**

11.1 **Report by the president of the Association (***agenda item 11.1***)**

11.1.1. The Group reviewed and endorsed the report by the president of the Association as given in Annex XVI.

12. CLOSURE OF THE SESSION (*agenda item 12*)

12.1. The president thanked all the participants for their active participation in the session. She also thanked the WMO Secretariat for the organization of and arrangements for the session. The tenth session of the RA V Management Group closed at 18:50 hours on 15 March 2014.

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Annex I

TENTH SESSION OF THE RA V MANAGEMENT GROUP
(Jakarta, Indonesia, 14 to 15 March 2014)

LIST OF PARTICIPANTS

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Annex II

TENTH SESSION OF THE RA V MANAGEMENT GROUP
(Jakarta, Indonesia, 14 to 15 March 2014)

AGENDA

1. Organization of the Session
2. Matters arising from the Ninth Session
3. Review of the activities of RA V subsidiary bodies
4. Development of RA V Strategic Operating Plan (SOP) 2012-2015 and SOP 2016-2019
5. Review of the draft RA V Implementation Plans of WMO Integrated Global Observing System (WIGOS) and WMO Information System (WIS)
6. Organization of the sixth Regional Conference (RECO-6) of Regional Association V
   - 6.1 Preparation of RECO-6 including concept note, provisional programme and work plan
   - 6.2 Review of the outcomes of the Survey Questionnaire for Challenges and Priorities in RA V and contribution to the WMO SOP 2016-2019
   - 6.3 Recommendations on the contribution of RA V to the SIDS Conference
7. Organization of the sixteenth session of Regional Association V (RA V-16)
   - 7.1 Preparation for RA V-16 including provisional agenda, work plan and side events
   - 7.2 Subsidiary Bodies of the Association: Future Work Mechanism
   - 7.3 Logistical arrangements
8. Regional Activities in 2014
9. Review of the location of the RAP Office
10. Representation of RA V in the Executive Council
11. Other Business
12. Closure of the Session

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TENTH SESSION OF THE RA V MANAGEMENT GROUP
(Jakarta, Indonesia, 14 to 15 March 2014)

THE REPORT OF THE WORKING GROUP ON INFRASTRUCTURE (WG-INFR)

World Meteorological Organization
Weather • Climate • Water

Working Group on Infrastructure: review of activities

MG-10, March 2014

Russell Stringer
Lead, Working Group on Infrastructure

Outline

- Objectives and Structure
- Activities of the Task Teams
- Lessons and the future

Objectives and Structure

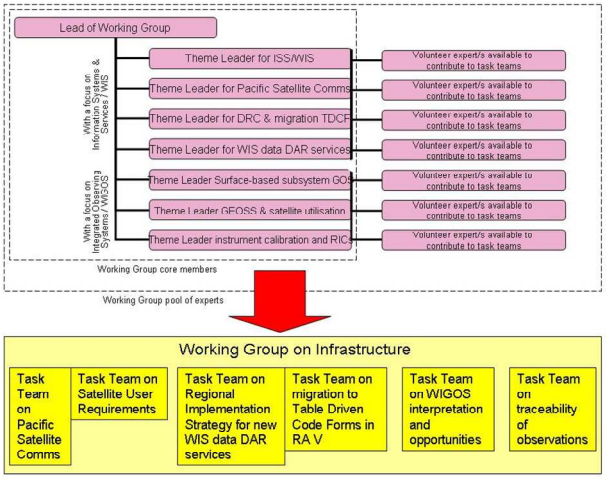
The objective of the Working Group on Infrastructure (WG-INFR) is to contribute to the improvement of infrastructure (data and information services) for weather, climate and water in Region V through implementation of the WMO Integrated Global Observing System (WIGOS) and WMO Information System (WIS).

WG-INFR is composed of experts nominated and made available by Member countries in RA V:

- A core group is formed by the Lead and seven Theme Leaders,
- A larger pool of experts is also available to contribute to the work of WG-INFR on specific tasks.

Objectives and Structure

Activities have been carried out in six Task Teams, as summarised in this diagram.



Each Task Team has its own specific objectives.

Activities of the Task Teams

TASK TEAM ON PACIFIC SATELLITE COMMUNICATIONS (TT-PSC)	
Objective	**To identify effective and achievable means for Pacific countries to obtain time-critical and operation-critical meteorological and related information and to provide observations and other hazards information.**

- correspondence, coordination and upgrade activities to deal with the transition of the US NOAA GOES-West satellite from the GOES-11 to GOES-15 (changes to direct readout (GVAR) data and EMWIN broadcast frequency and format);
- the RAPIDcast initiative has introduced a DVB-S broadcast service for the central and western Pacific and a number of receivers have been installed. A proposal for extension of receivers across the south Pacific has so far not attracted funds;
- the RANET Chatty Beetle Demonstration Project is continuing, with more deployed out to remote islands and villages and used to e-mail observations.

Activities of the Task Teams

TASK TEAM ON SATELLITE USER REQUIREMENTS (TT-SUR)	
Objective	**To identify and document the needs for satellite observation data and derived products of RA-V members, in the areas of interest of WMO Programmes and Co-sponsored programmes.**

- prepared a draft table of user priorities, through a series of phone conferences in 2012-2013;
- a poster on the work of TT-SUR was presented to the US NOAA Satellite Conference in 2013, several members of TT-SUR were present and were able to hold a face to face meeting;
- Consultation with users from many RA-V countries and the satellite providers was achieved in side events at the 4th Asia Oceania Meteorological Satellite Users Conference, Melbourne Oct 2013.
- A separate initiative by Australia to provide the Australian VLab Centre of Excellence has created good synergies for TT-SUR by actively engaging satellite users across the Region in a monthly seminar

Activities of the Task Teams

TASK TEAM ON REGIONAL IMPLEMENTATION STRATEGY FOR NEW WIS DATA DAR SERVICES (TT-DAR)	
Objective	**To assist Member countries in RA V to work together to achieve a coordinated approach to the implementation of new WIS data Discovery Access and Retrieval (DAR) services in RA V.**

- GISC Melbourne became operational in April 2013, using the OpenWIS system,
- AusAID accepted a proposal for funding for an activity titled "Training and implementing systems for participation by Pacific countries in open international exchange of meteorological data". The scope of this activity includes WIS and TDCF, delivered through:
  - a training workshop which was held in Melbourne, May 2013,
  - In-country visits underway to reinforce training and implementation,
- The RA-5 WIS Implementation Plan has been drafted and is to be submitted to RA-V-16 session for review and adoption.

Activities of the Task Teams

TASK TEAM ON MIGRATION TO TABLE DRIVEN CODE FORMS IN RA V (TT-TDCF)	
Objective	**To assist the coordination amongst Member countries of RA V of their plans for, and progress on, migration to the use of TDCF in accordance with WMO plans.**

- WMO monitoring results up to July 2011 indicated that RA-V was progressing comparatively well, with over 60% of both surface and upper air stations providing reports in BUFR format;
- AusAID accepted a proposal for funding for an activity titled "Training and implementing systems for participation by Pacific countries in open international exchange of meteorological data". The scope of this activity includes WIS and TDCF, delivered through:
  - a training workshop which was held in Melbourne, May 2013,
  - In-country visits underway to reinforce training and implementation.

Activities of the Task Teams

TASK TEAM ON WIGOS INTERPRETATION AND OPPORTUNITIES (TT-WIGOS)	
Objective	**To identify actions needed at the Regional level to implement the WIGOS framework, to document these in a Regional WIGOS Implementation Plan and to promote progress on the Plan.**

- A table of WIGOS Implementation Activities was drafted at the RA-V WIGOS Workshop (Jakarta, September 2012), then refined at the RA-V WG-Infrastructure meeting (Melbourne, April 2013);
- The R-WIP-V document was completed then presented to MG-9 (May 2013), distributed for comment to PRs (June/July 2013), reviewed by WIGOS Project Office (Jan 2014) then submitted to President RA-V for approval (Feb 2014);

Activities of the Task Teams

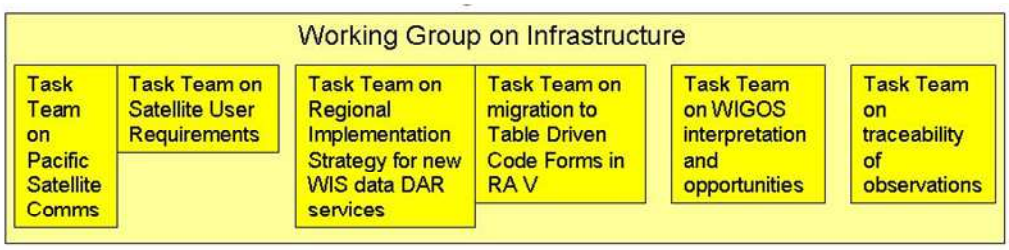
TASK TEAM ON TRACEABILITY OF OBSERVATIONS (TT-TO)	
Objective	**To monitor and assist the progress of Member countries of RA V to achieve traceability of instrument calibrations to international standards, building on the effective operation of Regional Instrument Centres.**

- Region V has already been benefiting from having Regional Instrument Centres in Australia (Melbourne) and the Philippines (Manila),
- CIMO organized a Training Workshop on Metrology for South-West Pacific RA V English Speaking Countries (Melbourne, Australia, 21-15 November 2011).
- A Training Workshop on Calibrations and Field Inspections (Nadi, Fiji, July/August 2012), supported in part by WMO.
- A questionnaire survey was distributed to RA V Members.

Lessons and the future

It becomes challenging to keep teams engaged and productive if there are a lot of them. We found that some groups had a big overlap in membership so could operate more like one team with two tasks. These were:

- Pacific Satellite Communications with Satellite User Requirements,
- WIS with Table Driven Code Forms



Lessons and the future

Regardless of the priorities of WMO and its Members, work can only be done if relevant experts are available. Some suggestions regarding experts:

- Issue the call for nominations as early as possible and support it with as much information as possible;
- Seek representation from many Members;
- Seek experts who also have a (past, present or prospective future) link to a relevant Technical Commission.

Support a face to face meeting early in the life of a Working Group or a Task Team.

Some activities need to be ongoing rather than time-bound task (such as monitoring the implementation of networks)

TENTH SESSION OF THE RA V MANAGEMENT GROUP
(Jakarta, Indonesia, 14 to 15 March 2014)

The Report of the Tropical Cyclone Committee for the South Pacific and South East Indian Ocean (TCC)

World Meteorological Organization
Weather • Climate • Water

Summary of Activities of Tropical Cyclone Committee for the South Pacific and South East Indian Ocean

MG-10, March 2014

On behalf of Mike Bergin
Chair, TCC

Weather • Climate • Water

TCC-14

- Fourteenth session of the TCC (TCC-14), Apia, Samoa, July 2012
- Reviewed 2010/2011 and 2011/2012 tropical cyclone seasons
- Reviewed:
  - TC Operational Plan
  - SWFDDP
  - Storm Surge Watch Scheme
  - CIFDP
- TC Operational Plan 2012 implemented

SWFDDP

- Severe Weather Forecasting and Disaster Risk Reduction Demonstration Project (SWFDDP)
- Six monthly progress reports for the Project can be found at the Met Connect Pacific website
- The Regional Subproject Management Team (RSMT) for SWFDDP met in Nadi in August 2013 (report available)

SWFDDP

- Key outcomes from the meeting included:
  - "SWFDDP continues to provide high quality guidance for severe weather events to the NHMs of the Region"
  - RSMC Wellington continues to host and maintain the SWFDDP Web portal, MetConnect Pacific (MCP), and to deliver the South Pacific Guidance (SPG) charts on MCP
- SWFDDP to continue its close working relationship with the RA V TCC
- New Implementation Plan developed

SWFDDP

- Criteria developed to transition the project to the "continuing development phase"
  - 1. appropriate non-TC warning system implemented and is operating smoothly
  - 2. severe weather and wave forecasts & warnings are verified
  - 3. all participating countries produce at least one case study per year
  - 4. all participating countries to complete all SWFDDP progress reports in full before the deadlines prescribed (six monthly)
  - 5. demonstrate on a continual basis that relationships between NMHSs and Disaster Management and Civil Protection Authorities (DMCPAs), the media and the public are strong and healthy
- A suitable, presumably Regional Organisation, to be identified to assume overall co-ordination and management of the project from around April 2015

Pacific International Training Desk

- Pacific International Training Desk - Honolulu
- In January US NWS announced the re-opening of the Pacific International Training Desk
- The reintroduction of this important program following a significant redesign, will deliver comprehensive training across a number of severe weather phenomena as well as tsunami, and will include communications and product delivery training.

TCC

- Next TCC meeting will be held in Port Vila from 26 to 30 May
- Had been hoped to hold several tsunami initiatives including a training activity and Regional WG meeting in the week before but other meetings made that scheduling impossible.
- TCC continues to look for synergies between IOC and WMO through TCC in the future

TENTH SESSION OF THE RA V MANAGEMENT GROUP
(Jakarta, Indonesia, 14 to 15 March 2014)

THE REPORT OF THE WORKING GROUP ON WEATHER SERVICES (WG-WXS)

World Meteorological Organization
Working together in weather, climate and water

WMO RA-V Working Group on Weather Services WG-WXS

Working Group on Weather Services

Objective

Contribute to implementation of:
- WMO Strategic Plan
- WMO RA-V Strategic Operating Plans 2010-11 & 2012-15

Strategic Thrust: Improving service quality and service delivery.
- *ER1:… deliver and improve access to high-quality weather, climate and water related environmental predictions, information and services in response to users' needs and to enable their use in decision-making by all relevant societal sectors.*
- *ER2:… reduce risks and potential impacts of hazards caused by weather, climate and water and related environmental elements.*

Strategic Thrust: Strengthening capacity building.
- *ER6: Enhanced capabilities of NHMSs, in particular in developing and least developed countries, to fulfil their mandates.*

Working Group on Weather Services

Objective

Regional Key Objectives:

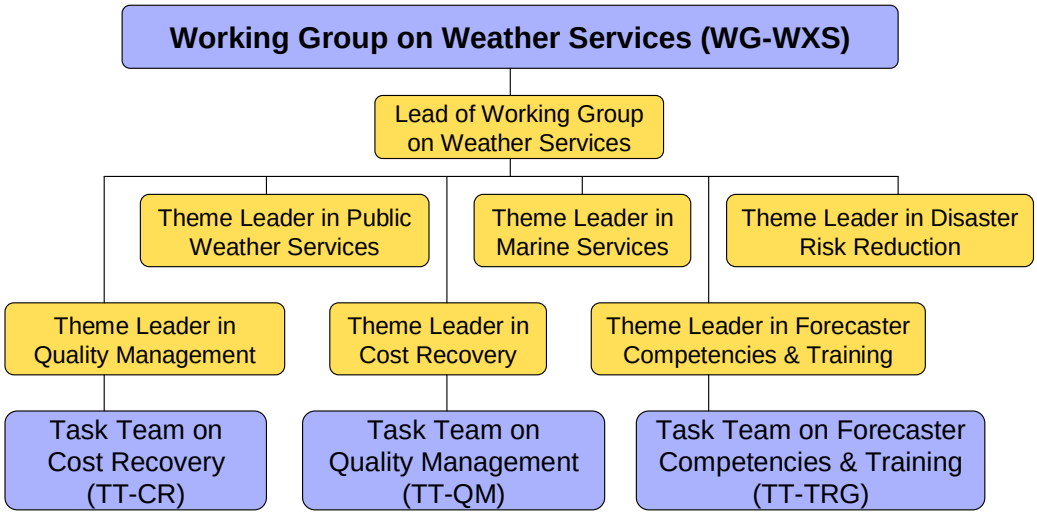
1.1.1 Aviation services effective and sustainable ***(Priority Area)***
1.1.2 Marine services improved
1.1.3 Public weather services improved
1.1.4 Services outreach and evaluation implemented
1.1.5 Service partnerships implemented
1.2.1 Services provision expanded

2.1.4 MHEWS focus and collaboration in NMHSs
2.1.4 Warning services provided

6.3.1 Training programmes effective for all NMHSs

Working Group on Weather Services

Structure



Working Group on Weather Services

Objective & Working Arrangements

Objective:

- The objective of the Working Group on Weather Services (WG-WXS) is to assist with improving weather service quality and delivery and to contribute to strengthening capacity building within NMHSs, with an initial focus on sustainable aviation weather services.

Meetings:

- Virtual team with regular meetings, via telephone or Skype;
- Chaired by the Lead of the Working Group;
- Secretariat duties provided on a rotating basis between the members;
- Minutes and action items provided to members of WG-WXS & MG via email within 10 working days.

Working Group on Weather Services

Terms of Reference

Terms of Reference:

- Monitor, promote & develop strategies to enhance the capabilities of RA-V Members to deliver and improve access to weather services, with an immediate focus on sustainable aviation weather services;
- Coordinate with relevant WMO & ICAO groups to assist with the implementation of an improved and sustainable weather and warning service;
- Identify and evaluate international best practice on the delivery of weather & warning services and communicate these with RA-V Members;
- Establish and coordinate Task Teams, as necessary, to complete specific tasks related to the objectives and priority areas of the WG-WXS;
- Report and provide advice to the RA-V Management Group on the above issues.

Working Group on Weather Services

Task Team on Cost Recovery

Objective:

- Assist with the implementation on a cost recovery framework in RA-V which meets the standards and recommendations of WMO and ICAO.

Benefits:

- The benefit of implementing a cost recovery framework is to ensure a sustainable and high quality of service for stakeholders, now and into the future.

Meetings:

- Virtual team with regular meetings, via telephone or Skype;
- Chaired by the Theme Leader;
- Secretariat duties provided on a rotating basis between the Task Team members;
- Minutes and action items provided to members of Task Team & WG-WXS via email within 10 working days.

Working Group on Weather Services

Task Team on Cost Recovery

Terms of Reference:

- Maintain awareness of current international developments in cost recovery;
- Maintain awareness of the current status and methods of cost recovery in RA-V member countries.
- Assist in the development and implementation of a cost recovery framework, based on WMO 904.
- Encourage the collaboration of RA-V countries in implementing a cost recovery framework;
- Provide advice to the WG-WXS on the above issues.

Working Group on Weather Services

Task Team on Quality Management

Objective:

- Assist and encourage NMHSs in adopting a quality management approach to the delivery of weather services and the pursuit of achieving certification of compliance with the ISO: 9001:2008 Quality Management Standard.

Benefits:

- Compliance with ICAO Annex 3 (standard from November 2012);
- External audit by a 3rd party, providing increased credibility & accountability;
- Sound and proven management framework & continuous improvement;
- Raising quality awareness, teamwork & communication;
- Improving documentation, including implementation of a Quality Manual;
- Enhancing client confidence & satisfaction.

Meetings:

- Virtual team with regular meetings, via telephone or Skype;
- Chaired by the Theme Leader;
- Secretariat duties provided on a rotating basis between the Task Team members;
- Minutes and action items provided to members of Task Team & WG-WXS via email within 10 working days.

Working Group on Weather Services

Task Team on Quality Management

Terms of Reference:

- Maintain awareness of current quality management issues, principles and practices;
- Maintain awareness of the implementation of quality management systems within NMHS in RA-V,
- Assist in the development and implementation of QMS within NHMS in RA-V; particularly with reference to the need to have a quality management system in place for aviation weather services by November 2012;
- Continually seek ways to improve the effectiveness of implementing QM by regional collaboration and mentoring;
- Provide advice to the WG-WXS on the above issues.

Working Group on Weather Services

Task Team on Quality Management

Activities:

- WMO TT-QMS Survey;
- BoM hosted QM website;
- Practical Guide for the Implementation of A quality Management System for NHMSs;
- WMO QM forum via Yammer;
- QM Comet module;
- 3rd meeting of WMO QMTT in Melbourne in March 2013;
- Internal Auditor training in Vanuatu (22 participants from 10 countries);
- Supervision of some members on internal audits;
- Lead Auditor training (of the internal auditors) to be conducted in Fiji in May.

Working Group on Weather Services

Task Team on Forecaster Competencies & Training

Objective:

- Assist with the implementation on a forecaster competency framework in RA-V which meets the standards and recommendations of WMO and ICAO.

Benefits:

- The benefit to the stakeholders will be assistance and collaboration in meeting the requirements for the implementation of a Competency Assessment framework within the meteorological providers of the member countries within WMO RA-V.

Meetings:

- Virtual team with regular meetings, via telephone or Skype;
- Chaired by the Theme Leader;
- Secretariat duties provided on a rotating basis between the Task Team members;
- Minutes and action items provided to members of Task Team & WG-WXS via email within 10 working days.

Working Group on Weather Services

Task Team on Forecaster Competencies & Training

Terms of Reference:

- Maintain awareness of current international developments in forecaster competency and training, in particular the work of WMO CAeM Task Team on Education & Training (ET/ET) and the Task Team on the Competency Assessment Toolkit (TT-CAT);
- Maintain awareness of current and developing expectations and requirements for the implementation of competency assessment systems within the NMHS, particularly the need to demonstrate compliance with competency requirements for aeronautical meteorological personnel by November 2013;
- Assist in the development and implementation of competency assessment systems in RA-V, based on WMO 258 (plus supplements) and the TT-CAT framework.
- Encourage the collaboration of RA-V countries in implementing the TT-CAT framework;
- Provide advice to the WG-WXS on the above issues.

Working Group on Weather Services

Task Team on Forecaster Competencies & Training

Activities:

- Survey regarding implementation of competency program for aviation forecasters.
- Contribution to WMO CAeM Expert Team on Education and Training and the Task Team on Competency Assessment Toolkit;
- Information provided on other training activities being held (including virtual sessions);
- Aeronautical Personnel Competency Standards (Forecasters and Observers);
- Implementation guidance of aeronautical meteorological forecaster & observer competency standards;
- FINPAC competency workshop in Apia from 22-26 July 2013;
- Training in Solomon Islands on issuance of SIGMET.

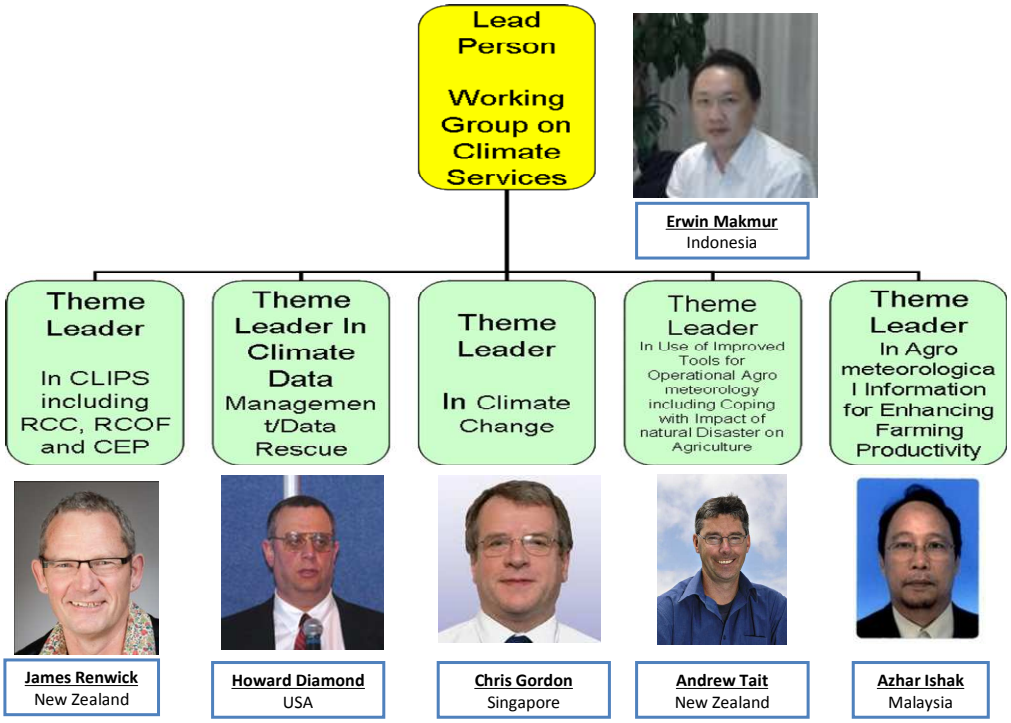
Report of the WMO RA V Working Group on Climate Services

WMO Regional Association V (South-west Pacific

Erwin Makmur

Introduction

- The Working Group on Climate Services has been established by the 15th session of World Meteorological Organization (WMO) Regional Association 5 (RA V) in Bali, Indonesia (30 April – 6 May 2010) and the subsequent 4th Session of the RA V Management Group.
- The objective of the Working Group on Climate Services (WG-CLS) is to to provide assistance and advice to the president of Regional Association V on all matters pertaining to the regional aspects of the relevant components of the World Climate Programmme (WCP) and the Agricultural Meteorology Programme (AMP)



1st Meeting of RA V WG on Climate Services

- The meeting of the Working Group on Climate Services for Regional Association V (RA V WG CLS) met 2-4 November 2011, hosted by the Solomon Meteorology Service at Honiara, Solomon Islands
- **The Meeting of the RA V Working Group on Climate Services –held in conjunction with the *RA V Regional Seminar on Climate Services***

1st Meeting of RA V WG on Climate Services

- In its deliberations, the Meeting referred to the presentations, discussions and outcomes of the *RA V Regional Seminar on Climate Services*.
- The Working Group reviewed its Terms of Reference, its working structure and its work plan as reflected in Annex VI of the *Final Report of the 6th RA V Management Group Meeting* (cf. *http://www.wmo.int/pages/prog/dra/rap/documents/FinalReport-RAVMG6.pdf*).
- The Group felt that strict prioritization is needed in light of the **limited resources and time available** in the current inter sessional period (2010-2014) and decided to **focus on a small yet specific and tangible** set of deliverables.

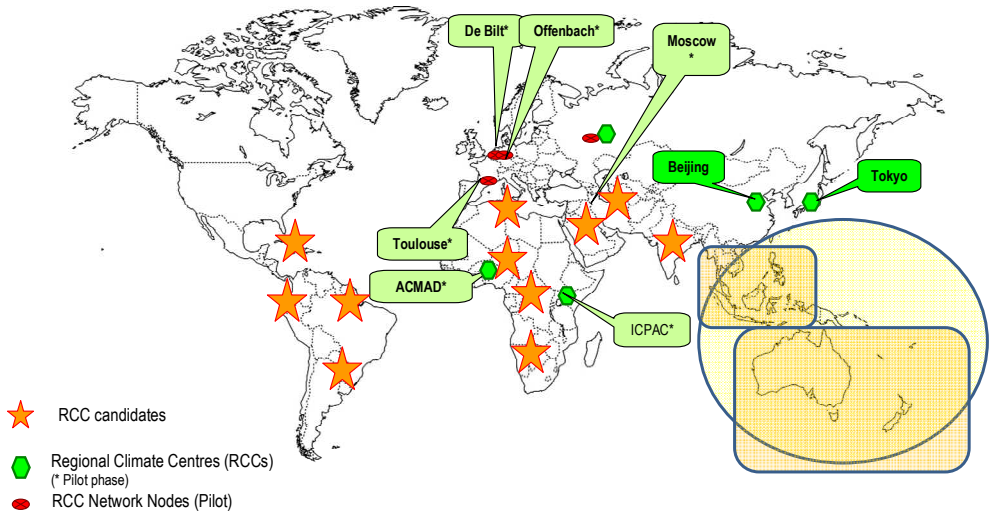
STRENGTHENING OF CLIMATE SERVICES IN RA V

Establishment of WMO Regional Climate Centre(s) in RA V

- WMO RCCs are considered as an important element of the GFCS Climate Services Information System (CSIS), providing mandatory and highly-recommended regional-scale climate-related services to NMHSs and thereby strengthening the capacities of WMO Members to deliver better national climate services. WMO RCC functions comprise services in the domains of climate predictions and projections, climate monitoring, climate data, training, research co-ordination and user liaison.

Overview of WMO RCCs implementation worldwide

(as of August 2011)



WMO RCCs: IMPLEMENTATION STATUS

RA I Africa initiated RCC implementation by identifying six RCCs (North African RCC-Network, ECOWAS RCC, IGAD RCC, CEMAC RCC, SADC RCC, African RCC); Demonstration phase formally initiated by ICPAC and ACMAD in Spring 2011

RA II Beijing and Tokyo designated as WMO RCCs in June 2009; North Eurasian Climate Centre (Russia) commenced RCC pilot phase in December 2010; India preparing for the pilot phase; Iran and Saudi Arabia expressed interest to host RCCs

RA III South America decided to establish 3 RCCs (CIIFEN to host Western SA RCC, Brazil+French Guayana to host Northern SA RCC, Argentina+Brazil to host Southern SA RCC);

RA III WGCS is developing the implementation plan

WMO RCCs: IMPLEMENTATION STATUS

RA IV Discussions underway; CIMH expressed interest

RA V Discussions underway (RA V WG-CLS likely to discuss on 4th Nov 2011)

RA VI Pilot phase of RA VI RCC-Network successfully concluded in summer 2011, Network ready for designation.

Polar RCCs under consideration

STRENGTHENING OF CLIMATE SERVICES IN RA V

Implementation of Watch Systems in RA V

- WMO's Climate Watch concept aims at enabling Members to issue climate advisories on observed and/or predicted monthly- to seasonal scale climate anomalies with potential negative impacts on societies. Elements of a Climate Watch system comprise, beside others, adequate observing and data management systems as well as climate monitoring and prediction services including regional guidance products from WMO RCCs and RCOFs.

WORK PLAN, DELIVERABLES AND TIMELINES

- Based on the discussions held during its meeting as well as during the RA V Regional Seminar, the Working Group concluded on five specific activities during the current inter-sesional period (2010-2014)

WORK PLAN, DELIVERABLES AND TIMELINES

Activity/Deliverable	Coordinator	Milestones	Reference to ToR of the RA V WG CLS*
1) Development of a document 'Best practices and resource guide for data management and data rescue'	Howard Diamond	Structure of document shared amongst WG members by 31 March 2012 1st draft of document available by Dec. 2012	To provide advice on methods to strengthen and improve climate system monitoring, analyses and indices
2) Facilitation of a first Southeast Asian Climate Outlook Forum (SEACOF) in 2013	Erwin Makmur	Detailed concept note shared amongst WG members by 31 January 2012 Facilitation of host identification Facilitation of SEACOF-1 session preparations SEACOF-1 in second half 2012/first half 2013	To provide advice on and assist in the implementation of various climate information and prediction services in RA V … To provide advice on … climate-related training workshops … To … provide advice on the use of … downscaling to produce useable regional and national climate forecasts and products
3) Facilitation of a RA V RClimDex training workshop including a report/peer-reviewed journal paper on RA V climate indices analyses	Chew Kian Hoe	Concept paper to be shared amongst WG members by April 2012 Facilitation of sponsor- and host identification Facilitation of workshop preparations Training workshop by end of 2013	To provide advice on methods to strengthen and improve climate system monitoring, analyses and indices To provide advice on and assist in the implementation of various climate information and prediction services in RA V …

WORK PLAN, DELIVERABLES AND TIMELINES

Activity/Deliverable	Coordinator	Milestones	Reference to ToR of the RA V WG CLS*
4) Assessment of current RCC-related functions being performed in RA V vis-à-vis the mandatory and highly-recommended RCC functions and subsequent gap analysis	James Renwick	Structure of survey shared within WG by 31 March 2012 1st draft analysis document available by Dec. 2012	To provide advice on and assist in the implementation of various climate information and prediction services in RA V … To provide further advice and proposals on the role, structure and mechanism of the RCCs in the region Res 2 (RA V-XV)
5) Development of a review document on the current use of climate information for agriculture in RA V	Andrew Tait	Structure of document shared amongst WG members by 31 March 2012 1st draft of document available by Dec. 2012	To provide advice on and assist in the implementation of various climate information and prediction services in RA V …, including agriculture …

Progress Reports of WMO RA V WG on Climate Services

Activity/Deliverable	Coordinator	Progress until December 2013	Barriers
1) Development of a document 'Best practices and resource guide for data management and data rescue'	Howard Diamond (Theme Leader for Climate Data Management/Data Rescue, howard.diamond@noaa.gov)	- Document outlined completed in April 2012 - In addition to the two experts from Tonga and Vanuatu, we have enlisted the help of some persons from both the Australian Bureau of Meteorology as well as the Indonesian *BMKG*, to assist in populating the outline and producing a first order version of the guide.	- The goal is to have a first draft of the document prepared by December 2012, but finding the resource time to do this is always a challenge. - The group will do its best to meet this deadline
2) Facilitation of a first Southeast Asian Climate Outlook Forum (SEACOF) in 2012	Erwin Makmur (Chair of WG CLS, erwin.makmur@bmkg.go.id)	The 1st SEACOF (or ASEANCOF) was conducted 3-5 December 2013 in Singapore	

Progress Reports of WMO RA V WG on Climate Services

Activity/Deliverable	Coordinator	Progress until December 2013	Barriers
3) Facilitation of a RA V RClimDex training workshop including a report/peer-reviewed journal paper on RA V climate indices analyses	Chew Kian Hoe (Theme Leader for Climate Change, Chew_kian_hoe@met.gov.sg)	There was already a Rclimdex workshop for the Pacific islands in New Caledonia, sponsored by Australia, in May this year. Singapore will be hosting a Rclimdex discussion for SE Asia as well next week	Some of these recent and current Rclimdex studies have not included Indonesia, which is a big region. It is possible to pitch a RClimdex workshop with focus on Indonesia, Malay Peninsula and close by Pacific islands PNG, East Timor and northern Australia.
			15

Progress Reports of WMO RA V WG on Climate Services

Activity/Deliverable	Coordinator	Progress until December 2013	Barriers
4) Assessment of current RCC-related functions being performed in RA V vis-à-vis the mandatory and highly-recommended RCC functions and subsequent gap analysis	James Renwick (Theme Leader for CLIPS including Regional Climate Centre, Regional Climate Outlook Forums and Climate Extreme Prediction, j.renwick@niwa.co.nz)	Drafted a questionnaire for RA-V members, on RCC functions. Circulated to members of RA-V management group in early 2012, and received feedback. In the process of revising draft for circulation to RA-V members.	Lack of time to devote to this task has slowed progress. Presently aim to have final draft questionnaire finished and circulated during July, with responses back by end of October.
5) Development of a review document on the current use of climate information for agriculture in RA V	Andrew Tait (Theme Leader for Use of Improved Tools for Operational Agro meteorology including Coping with Impact of natural Disaster on Agriculture, a.tait@niwa.co.nz)	• "Climate Services for Agriculture" questionnaire has already sent all RA V countries and waiting for response • Updating the for contact list	Still miss contact people from RA V member 16

Achievement (2011-2014)

- WMO CLIPS Training Workshop on Operational Climate Prediction for Southeast Asia
- Draft Documents “Defining best practice for implementing and managing CDMS”
- Questionnaire on Capabilities and needs for a Regional Climate Centre (RCC) in regional Association V (South-West Pacific)
- Questionnaire on Current use of climate information and services for agriculture in RA V
- First Climate Outlook Forum Meeting

WMO CLIPS Training Workshop on Operational Climate Prediction for Southeast Asia

(27 September – 7 October 2011)

- BMKG Training Center Facilities (Multi-Purpose Building), Citeko, Bogor – Indonesia
- Objective: To increase skills of forecaster for providing better climatological services through better use of with latest practical knowledge/tools and To build partnerships across organizations/countries/application areas
- 20 participants from ASEAN NHMs
- Lecturers: BMKG, IPB, IRI, KMA, PAGASA, IMD, BoM, NOAA

Draft Documents "Defining best practice for implementing and managing CDMS"

The type of information includes:

- Recommended practices for installing CDMS
- Training and capacity building guidelines for NMHS
- Support and sustainability
- Upgrades, modifications and strategies for future development, including advice on how to manage the situation where other countries seek access to a CDMS, then wish to make their own modifications: while this is typical of open source environments, the risk arises that a CDMS, such as CliDE, becomes significantly different to the original, and therefore cannot be supported.

Questionnaire on Capabilities and needs for a Regional Climate Centre (RCC) in regional Association V (South-West Pacific)

- To assess current Regional Climate Centre (RCC)-related functions being performed in RA V in relation to the mandatory and highly-recommended RCC functions, and to perform a subsequent gap analysis
- Representatives from NMHSs in RA V are asked to complete the questionnaire that follows, to assess the level of RCC-related functions carried out across the Region, and to help identify any gaps to be filled in through the establishment of an RCC in RA V

Questionnaire on Current use of climate information and services for agriculture in RA V

- the kind of climate information and products that are currently being produced (both general level information and agriculture-specific information) with examples;
- the ways such information is being delivered (again, both general level delivery and specific delivery to agricultural sector users);
- examples of the use of such information by agricultural sector users;
- some user feedback, where possible, on the usefulness of the information; and
- an evaluation of gaps and needs to improve the use of climate information for agriculture for the country

Barriers

- Limited WG member meeting (once only)
- Less participation from RA V members for questionnaire feedback
- Still miss contact people (right person) from RA V member

Annex VII

REGIONAL ASSOCIATION V
WORKING GROUP ON HYDROLOGICAL SERVICES
WORKING GROUP REPORT

The World Meteorological Organization (WMO) Regional Association 5 (RA-V), at its 15th Session in Bali, Indonesia (30 April to 6 May 2010) and at the subsequent 4th Session of the RA-V Management Group established the Working Group on Hydrological Services (WG-HYS).
Based on the WMO Strategic Plan (SP) with a focus on Regional Strategic Planning and the new approach to RA V Working Mechanism, the WG-HYS focused on improving hydrological forecasts, providing more accurate, timely and reliable forecasts and warnings and enhanced delivery of information and services. The main areas within hydrological services that were considered the most important included:

- Education, training and capacity building;
- HYCOS Projects;
- Adaptation to climate change in the water sector;
- Water quality monitoring and assessment;
- Sustainable maintenance and calibration od equipment for hydrology and water resources;
- Flood forecasting;
- Exchanging and sharing of hydrological data and information; and
- Quality management framework.

To address this set of issues, the RA V Management Group established the WG-HYS (Figure 1) with the following sub-groups:

- WHYCOS
- QMF-Hydrology
- Water Quality Assessment
- Hydrological Forecasting and Drought Prediction
- Climate Change Impact on the Water Sector

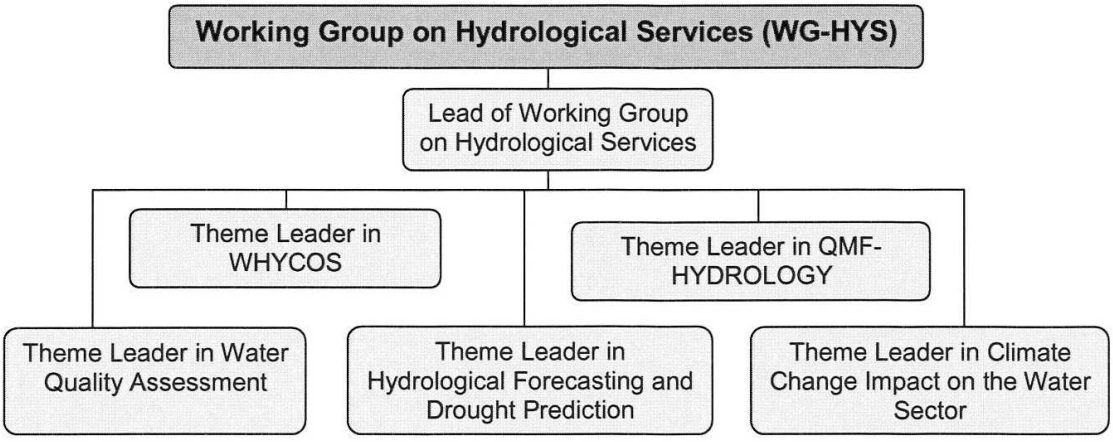


Figure 1. Structure of the RA WG-HYS

At the kind invitation of the Government of New Zealand, the eighth session of the RA V Working Group on Hydrological Services (WG HYS) was held from 25 to 29 November 2013 at the National Institute of Water and Atmospheric Research (NIWA) at 10 Kyle Street, Riccarton, Christchurch 8011, New Zealand.

WHYCOS

The WG-HYS was kept informed of the status of the various Hydrological Cycle Observing System (HYCOS) components and also the outcomes of the 2011 World HYCOS (WHYCOS) review. The WG-HYS supported the focus of the new HYCOS components (water resources management, flood forecasting and warning, etc) and agreed that the commonalities between the components (practices, procedures, implementation plans, maintenance, vandalism, etc.) and the issues that grabbed the attention of donors, such as climate change and its impacts on water resources and disaster risk reduction and resilience were of importance in the development of future HYCOS proposals in the Region.

The Pacific HYCOS Project Phase I was designed to assist the water agencies in 14 Pacific island countries further develop their knowledge and understanding by strengthening their resources and technical capacity to collect hydrological data and carry out water resource monitoring. It achieved this by providing the necessary in country and hands on training to the relevant water agency staff and with new equipment and technology provided to them as part of the project. The hydrological equipment and training supported the water agencies in the sustainable collection of hydrological data, archived in a functional database facilitating access, analysis and interpretation of the datasets for improved understanding. This information and improved understanding will allow the water resource managers, decision makers and the community to make improved decisions on the long term sustainable development of their groundwater and surface water resources Pacific HYCOS focused on six main objectives:

1. Water resources assessment in major rivers
2. Groundwater monitoring and assessment
3. Water quality monitoring and assessment
4. Water resources databases
5. Flood forecasting capability
6. Drought forecasting

Questions for a future WG-HYS are: Are the HYCOS objectives still relevant to the Region and if so, how would you structure a Pacific HYCOS Phase II based on the experience of Phase I?

The Pacific-HYCOS had provided some initial impetus for other initiatives, including, for example additional groundwater monitoring in Samoa. Issue of climate change (floods and droughts), health and food security was seen as new factors which will influence the need for more water resources information. A joint hydrology/meteorology effort was also promoted and a joint integrated approach with disaster risk reduction and climate change adaptation. The Pacific-HYCOS concept remains relevant and new issues were now of relevance, especially climate change, that necessitated a combined weather-climate-water approach, including integration of networks. It was therefore important that linkages with other RA Working Groups (such as tropical cyclones, disaster risk reduction and climate matters) are maintained. The outcomes of Pacific-HYCOS Phase I need to be up-scaled as part of a Phase II initiative. A linkage will need to be made with the Regional Integrated Water Resources Management Action Plan. Monitoring and evaluation was identified as an important component of future initiatives, especially in terms of ensuring political support, budget allocations and sustainability. The topics of gender mainstreaming and legislative support and value of hydrological monitoring for national planning for water resources management were also raised as being of importance.

Hydrological development has been achieved through the Pacific-HYCOS Phase I, including improved instrument housing (against vandalism). Capacity development/building was also seen as an essential component of the next Phase. The last hydrological technician training was in 2004 to 2006 and many people have moved on and the area of hydrological activity has also changed. The deterioration of the equipment that was purchased is also becoming an issue, especially with respect to the new types of equipment that were introduced. It will be important to look at the lessons learnt as part of the implementation stages for Phase II and thus a focused meeting on lessons learnt should be considered as part of the development of a Phase II implementation plan.

The desire to implement an SEA-HYCOS, as discussed at the previous meeting, was again raised by Indonesia, Philippines and Malaysia and has been addressed in the Future Work Programme.

QMF-Hydrology

Within the Region, New Zealand has formally adopted a quality assurance approach for hydrological data collection. NIWA have implemented the ISO standards in the area of hydrological data collection. The Working Group noted the growing importance of having a quality assurance programme and anecdotal evidence of this was provided with respect to erosion and inundation issues. Indonesia has an example of the use of a national institution for the inspection of operations of gauging stations from an independent authority perspective. Cost and time factors in implementing quality assurance needed to be taken into consideration, but there were significant benefits. The Group agreed that the provision of guidance to NHSs for implementation of a Quality Management System (QMS) including the possible inclusion of case studies would be of benefit to the Region and could be considered for the Future Work Programme.

Water Quality Assessment

There have been limited advances in water quality assessment in the Region during the intersessional period and all Pacific Island Countries have identified this as being a area that needs attention during the next intersessional period. SPREP had also indentified this need from a capacity building perspective.

Hydrological Forecasting and Drought Prediction

The WG-HYS were kept informed of the activities associated with the Associated Programme of Flood Management (APFM) and the Integrated Drought Management Programme (IDMP). Indonesia also provided information on a pilot flood forecasting and early warning system they have been implementing to the WG-HYS. The software (Delft-FEWS) being used was made available by Deltares for this pilot project. New Zealand also provided information on their flood forecasting system, including “TopNet on the Desk” a Graphical User Interface (GUI) which allows users to run TopNet and visualize the results on their own computer. The software provided flood estimates for both gauged and ungauged river systems. Malaysia also kept the WG-HYS informed of a flood forecasting and warning operations (Integrated Flood Forecasting and River Monitoring (IFFRM) System) they have been implementing. Arrangements have been made within the Region that will enable cooperation between these various initiatives.

The Australian Bureau of Meteorology is in the process of the implementation of the United States Hydrological Research Centre’s Flash Flood Guidance System (FFGS). The WG-HYS will take a watching brief on advances in this regard. Access to improved quantitative precipitation estimates and quantitative precipitation forecasts was seen as the key to improved flood forecasting and warning. The WG-HYS also saw benefit in hydrological applications from seasonal climate outlooks. There was considerable discussion around the applicability of models to varying environments, both climatological and hydrological, and also on the precision required in rainfall estimates and peak flow measurements for flood forecasting and warning purposes. Depending on the situation and the accuracy required for the flood forecast, the precision of rainfall and high level flood gaugings were both of importance, especially when considering error propagation. The Commission for Hydrology will soon publish a technical report on an intercomparison of flood forecasting models which will be distributed to all participants.

The WG-HYS reported on the practicalities for improving the benefits of early warning systems and enabling them to be more effective, especially in situations where the lead times are short. It was noted that a range of options could be investigated including, but not limited to:

- Improved floodplain and flood management planning through hydrological inputs to planning and development proposals;
- Efforts to increase the lead time through improved cooperation between hydrological and meteorological services;

- Community education and awareness through response action plans developed in cooperation with emergency services; and
- Adoption of new, appropriate flood forecasting tools, including dissemination options.

The WG-HYS are aware that the issue of drought is becoming increasingly important in the region and that early warning systems related to the onset of drought are required.

The WG-HYS believes that linkages with the Severe Weather Forecasting Demonstration Project in the region in general and the Coastal Inundation Forecasting Demonstration Project in Fiji in particular were essential. This was seen as an excellent opportunity to foster cooperation between the National Meteorological and Hydrological Services.

Climate Change Impact on the Water Sector

The WG-HYS was kept informed of progress with the implementation of the Global Framework for Climate Services (GFCS). Involvement of the water sector in a meeting on the GFCS in the Cook Islands in the first quarter of 2014 was seen as essential because of the considerable benefit to water resources management in the Region. Water resources are directly related to climatic factors and monitoring water resources will show the impacts of climate variability and change.

The WG-HYS identified a range of observations from within their countries related to national approaches to issues associated with climate change and water as follows:

- Climate change is just one of the factors that need to be taken into consideration in water resources management, others include, but are not limited to human activities, land use practices, population growth, urbanization, water resources allocation, pollution, etc.;
- Saltwater intrusion into aquifer systems is a problem across the Region which is linked to climate change amongst other factors;
- Increased experience of drought conditions have also been experienced in some countries and national drought polices are planned;
- The changes in frequency and severity of events (for example typhoons, cyclones, droughts in some areas) have had widely varying impacts;
- The quality and uncertainties of the regional downscaling activities is becoming increasingly important as capabilities improve;
- All countries face ongoing climate variability management issues and many of the practices and procedures are valid in a trending world, but need to be adjusted and modified, for example improving water use efficiency, use of rainwater harvesting, desalinization plants;
- There are a wide range of projects being implemented amongst a number of different groups and over coordination of activities may become important in the future;
- There has been an initial focus on coastal protection and also urban areas, with some studies of outer island issues;
- Climate change impacts on water security, infrastructure design information (hydrological design), protocols for storage operations are areas that have received attention;
- Most national planning processes are now taking climate change into consideration;
- The use of tariffs and licensing as a water resources management tool has been adopted in some areas;
- Improved observation systems, surface water and groundwater (quantity and quality), are required to monitor the impacts of climate change;

Future Programme of Work

The WG-HYS discussed topics and activities that they would like to see considered by the next session of the RA V WG-HYS should it be re-established.

With respect to the mode of operation for the next session of the RA WG HYS, the participants proposed that the model of a WG-HYS and a small number of dedicated Task Teams be retained.

The WG-HYS recommended that the Working Group on Hydrological Services should be re-established with an operational plan (Appendix I) formulated around the Future Work Programme, especially when consider the current status of hydrological services in the Region. The WG-HYS also noted that meeting only once every four years is a limiting factor in terms of making substantial achievements and that opportunities for further interactions should be made through workshops or training events organized during the intersessional period and the use of electronic means. Considerable advances have made through closer interactions within the meteorological community and such advances are now necessary for the hydrological community, including improved interactions and relationship between meteorology and hydrology.

Appendix I to Annex VII

REGIONAL ASSOCIATION V
WORKING GROUP ON HYDROLOGICAL SERVICES
WORKING GROUP REPORT

Draft RA V WG-HYS Proposed Technical Plan and Implementation Programme

(2014 – 2017)

1. PROVISION OF TRAINING & CAPACITY BUILDING

Deliverables	Activities	Responsible	When (Years)
A set of competencies for provision of hydrological services, including technicians and professionals	Establish a sub-group of the WG to develop appropriate competencies and related training requirements	Chair to designate WG Members; Su-group: SPC	2014, 2015
Technical training carried out in at least one country per year (topics to include highest priority as determined by Members)	Identify Members requiring this training; seek sponsorship; undertake the training;	Members needing support of this kind; trainers and sponsors; WMO: SPC	2014, 2015, 2016, 2017
Training in quality assurance to be provided	Training session based on guidance material developed under data management theme	Lead by NZ and based on guidance developed under data management theme; WMO	2015, 2016
Catalogue of available of technology in use in the Region	Survey of instrumentation in use;	Lead by SPC; WMO; HYCOS projects	2016, 2017
Reinforced communication platform for hydrological services in the region	Build on IWRM forum, e-mail and other platforms	Lead SPC and Pacific HYCOS for Pacific and SEA HYCOS for SEA,	2015, 2016

2. HYDROLOGICAL DATA MANAGEMENT

Deliverables	Activities	Responsible	When (Years)
Guidance material on the establishment of a quality assurance programme, including finance strategies	Development of a guidance manual with case studies.	NZ and other members as appropriate	2014, 2015
Guidance and training on water information systems, Neon and Delft-FEWS	Workshop on improved presentation of hydrological data and information	Secretariat to invite participants under guidance of Chair;	2014, 2016
Pacific HYCOS Phase II concept document	Establish a sub-group of the WG to develop concept document; consultancy	Chair to designate WG Members; Su-group; SPC;WMO	2014, 2015
SEA HYCOS Phase I concept document	Establish a sub-group of the WG to develop concept document; consultancy	Chair to designate WG Members; Su-group; WMO	2015, 2016

3. DISASTER RISK REDUCTION

Deliverables	Activities	Responsible	When (Years)
Improved Quantitative Precipitation Estimates and Forecasts	Joint activities with SWFDP	Chair to nominate representatives from WG to link to SWFDP	2014, 2015, 2016, 2017
Guidance on rainfall based flood forecasts	Development of guidance material	Chair to designate WG Members; Su-group	2014, 2015, 2016, 2017
Improved Flood Forecasting Systems and Techniques	Implementation of FFGS in the Region: Reports on regional applications; IFAS, TopNet, IFFRM, Delft-FEWS etc	Chair to designate WG Members; Su-group; Indonesia; Australia	2014, 2015, 2016, 2017
Improved linkages with DRR community	Hydrological inputs to end-to-end multi-disaster warning systems - CIFDP	Chair to nominate representatives from WG to link to CIFDP	2014, 2015, 2016, 2017

4. WATER AND CLIMATE

Deliverables	Activities	Responsible	When (Years)
Improved Drought Monitoring and Management Capabilities	Evaluate accuracy of seasonal predictions for water management purposes; Improve water elements in CliDE;	Chair to designate WG Members; Su-group: Link to RA WG on Climate	2014, 2015, 2016, 2017
Benefits achieved for the water sector through the implementation of GFCS	Involvement in GFCS activities Represent WG in GFCS initiatives	Chair to nominate representatives from WG to link to RA V WG on Climate	2014, 2015, 2016, 2017

Annex VIII

TENTH SESSION OF THE RA V MANAGEMENT GROUP
(Jakarta, Indonesia, 14 to 15 March 2014)

THE LTTER FOR REQUESTING PRESIDENTS OF REGIONAL ASSOCIATIONS AND TECHNICAL COMMISSIONS TO PROVIDE INPUTS TO THE PLANNING PROCESS OF WMO OF 2016-2019

World Meteorological Organization
Organisation météorologique mondiale
Secrétariat
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Weather • Climate • Water
Temps • Climat • Eau

Our ref.: SG/ASG/SPO/RAs-TCs-OP2016-2019 GENEVA, 4 March 2014

Subject: Preparation of Operating Plans (OP) for regional associations and technical commissions

Action required: Your submissions should reach the Secretariat not later than **1 April 2014**

Dear Sir/Madam,

I refer to my letter (ref. P.RA-1752 and P.TC-1734) of 27 November 2013, requesting you to develop your respective operating plans that will form part of the draft WMO Operating Plan (OP) 2016-2019.

The third session of the EC Working Group on WMO Strategic and Operational Planning (WG/SOP) held in Geneva from 11 to 14 February 2014 noted the recommendations of the presidents of regional associations and technical commissions on the WMO strategic and operational planning and appreciated their inputs into strategic planning process. It also noted that at the time of the meeting only presidents of Regional Association II, CAS and JCOMM had presented their input for the WMO Operating Plan.

The WG/SOP agreed that the PRAs and PTCs that had not submitted their inputs to the OP be requested to do so by **1 April 2014** so that the Secretariat could finalize the WMO Operating Plan 2016-2019 for presentation at the sixty-sixth session of the Executive Council in June 2014 before it is presented to the Seventeenth World Meteorological Congress in May-June 2015.

You are therefore kindly requested to provide your input if you have not done so on or before **1 April 2014**. The updated template for providing input similar to that used for budgeted and funded activities for implementation is posted (in excel format) at:

http://www.wmo.int/pages/about/documents/Templateforprovidinginput_OP_2016_2019_PRA_PTC.xls

To: Presidents of regional associations (P.RA-1755)
Presidents of technical commissions (P.TC-1737)

Annex IX

TENTH SESSION OF THE RA V MANAGEMENT GROUP
(Jakarta, Indonesia, 14 to 15 March 2014)

WORLD METEOROLOGICAL ORGANIZATION
_____

EC WORKING GROUP ON WMO STRATEGIC AND OPERATIONAL PLANNING (WG/SOP)

Third session

GENEVA, 11-14 February 2014

EC WG/SOP-III(2014)/Doc. 5.1
06.II.2014

Item: 5.1

ENGLISH ONLY

Role and responsibilities of regional associations and any corresponding amendment of the general regulations

(Submitted by the Secretariat)

Summary and Purpose of Document

This document presents elements for a better definition of the role and responsibilities (R&R) of the Regional Associations and make proposals for recommendations to EC-66 on this matter, and options on the process to be followed up to the seventeenth session of Congress.

ACTION PROPOSED

Pursuant to the request of EC-64 and EC-65, the Group is invited to consider the possibility of developing abroad and flexible definition of the role and responsibilities (R&R) of Regional Associations (RAs) and make a proposal to EC-66 for consideration, including potential amendments to the General Regulations 17 on this matter and , and options on the process to be followed up to the seventeenth session of Congress.

REFERENCES:

1. *Abridged final report with resolutions of the Sixty-fourth session of the Executive Council, Part I* (WMO-No. 1092), Geneva, 25 June–3 July 2012
ftp://ftp.wmo.int/Documents/PublicWeb/mainweb/meetings/cbodies/governance/executive_council_reports/english/pdf/64_session_1092_part1_en.pdf

2. *Abridged final report with resolutions of the Sixty-fifth session of the Executive Council, Part I* (WMO-No. 1118), Geneva, 15 to 23 May 2013,
https://docs.google.com/a/wmo.int/file/d/0B8DhC1GSWSmxMDVfTHVLdjdnVlE/edit

DISCUSSION

1. Proposal for defining the role and responsibilities of regional associations through general terms of reference and any corresponding amendment of the General Regulations

The outstanding task of the Group is to come with a final draft text of the amendment for consideration by EC-66 and options on the process to be followed up to the seventeenth session of Congress.

Regulation 162 could be clarified as follows by adding the underlined text:

The associations of the Organization and their general terms of reference shall be those specified in Annex II to these Regulations. Each association shall be responsible for carrying out the functions specified in Article 18 (d) of the Convention within the area allotted to that association in Annex II.

The following draft text for complementing of Annex II to the General Regulations is proposed to the ECWG-SOP in February 2014: (track changes on the draft discussed by EC-65 including comments from PRA 2014 meeting).

General terms of reference
(Note: to be included in Annex II before the geographical description)

In carrying out the functions specified in Article 18 (d) of the Convention within the allotted geographical areas defined in this Annex, under the general guidance of Congress and the Executive Council and with support from the Secretariat, each regional association, in close coordination and collaboration with other bodies concerned, shall:

a. *Coordinate and organize activities of their Members at regional and sub-regional levels relating to the planning, implementation and evaluation of agreed programmes, strategies and activities.*
b. *Study the needs of its Members and sub-regions with regard to their technical and institutional capacity and identify gaps impeding timely implementation of planned programmes and activities; collaborate with Members, Technical Commissions and other bodies, as necessary, in resolving critical deficiencies.*
c. *Promote cooperation and efficiency through establishment of regional networks and facilities based upon identified regional needs in close coordination with the Technical Commissions concerned; monitor the performance of regional networks and facilities and require corrective measures as necessary.*
d. *Establish regional operating plans and other implementation plans, as necessary, addressing agreed strategic priorities from a regional perspective and ensuring engagement of the Members in focused activities aimed at achieving the expected results of the WMO Strategic Plan.*
e. *Structure its work to address regional priority areas and engage the available expertise of its Members to provide guidance and assistance in accordance with the needs of the region.*
f. *Build and promote cooperation and partnership with relevant regional organizations, including the UN Regional Economic Commissions, other UN bodies, sub-regional organizations, development partners, NGOs, professional associations.*
g. *Ensure visibility and recognition of WMO in their respective regions and engagement in regional initiatives and projects related to the strategic priorities of the Organization.*

2. Further steps

The Group may wish to review and comment on the proposed amended text. Regarding planning of the next steps to be followed up to the seventeenth session of Congress, the Group could provide guidance to be debated and decided upon at EC-66 on the following:

- Further coordination of the proposal with the RAs before Cg-17. It should be noted that RA IV and RA VI have already expressed their support to the proposal at their last sessions in 2013; the PRA meetings in 2013 and 2014 have also supported the proposal and further support will be sought at the next sessions of RA V, RA III and RA I during 2014.
- Feedback from those RAs which may have decided to start implementing those TORs before formal adoption by Congress.
- Consideration of developing templates to monitor the implementation of these TORs, harmonized with the overall WMO E&M system, to facilitate the development of revised TORs as may be deemed necessary in the future.

In addition to the development of the final proposal to Cg-17, it may be appropriate to invite Members to sensitize the governments on the likelihood of having to amend the General Regulations in compliance with Regulation 2 of the General Regulations.

Appendix to Annex IX

Background

The proposal for a better definition of the role and responsibilities (R&R) of the Regional Associations has been discussed in a series of sessions of PRA, EC WG-SOP and EC. It is recalled that in 2012, EC formulated Resolution 1 (EC-64), *Review of the role and responsibilities of regional associations*, in which WG-SOP was tasked to review the provisions relating to the functions, role and responsibilities of the regional associations in the WMO Convention and General regulations and evaluate the need for amendments. This task is related to the continues improvement of processes and procedures of the Organization, in particular, with the need for a better definition of the roles and responsibilities of the constituent bodies as the major stakeholders in the WMO integrated planning and implementation process.

WG-SOP followed up the resolution and presented the findings to EC-65 in 2013. The Session agreed, in general, with the proposed structure of the draft text for amendment of the general regulations and requested the Secretariat to assist in developing broad and flexible definition of R&R with a view of taking a decision at EC-66 in 2014.

Progress

Following the advice by EC-65, the draft proposal for amendment to the General Regulations concerning the R&R of the RAs has been presented to the RA Session (RA IV in March 2013 and RA VI in September 2013). Both sessions confirmed the need for better definition of the R&R of the RAs and supported the structure of the amendment to the general regulations in the form of an addition to the ANNEX II of the General Regulations. A draft text has been discussed by the PRA meeting in January 2014, which suggested few modifications to an initial text proposal drafted by the Secretariat, and the addition of a revised text for the Regulation 162 of the General Regulations.

Annex X

TENTH SESSION OF THE RA V MANAGEMENT GROUP
(Jakarta, Indonesia, 14 to 15 March 2014)

WORLD METEOROLOGICAL ORGANIZATION

WMO INTEGRATED GLOBAL OBSERVING SYSTEM (WIGOS)

REGIONAL WIGOS IMPLEMENTATION PLAN
FOR
REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC)

(R-WIP-V)
Version 0.9
(30/08/2013)

VERSION CONTROL

Version	***By***	***Date***	***Changes***
….			Initial template provided by WIGOS-PO
0.3	WIGOS-PO	09/01/2013	Table of WIGOS implementation activities prepared by the RA-V WIGOS Workshop, then added to the template R-WIP-V
0.4	WG-INFR	27/04/2013 and 12/05/2013	Gaps in text completed, table of implementation activities reviewed. Feedback from WG-INFR members incorporated.
0.9	Chair, WG-INFR	30/08/2013	Final version 0.9 after review by PRs of Member countries in RA-V, then finally the WIGOS Project Office, ready for approval by President RA-V.
1.0	Approval by the President of RA V	15/03/2014	Enhancements by MG-10 and approval.

CONTENTS

WIGOS IMPLEMENTATION PLAN

1. INTRODUCTION AND BACKGROUND

1.1 Purpose of WIGOS and Scope of the Regional WIGOS Implementation Plan for RA V (R-WIP-V)

The WMO Integrated Global Observing System (WIGOS) provides a new framework for WMO observing systems, including the contributions of WMO to co-sponsored observing systems. It is important to recognize that WIGOS is not replacing the existing observing systems, but is rather an over-arching framework for the evolution of these systems which will continue to be owned and operated by a diverse array of organizations and programmes. WIGOS will focus on the integration of governance and management functions, mechanisms and activities to be accomplished by contributing observing systems, according to the resources allocated on a global, regional and national level.

The WIGOS Framework Implementation Plan (WIP) addresses the necessary activities to establish an operational WIGOS Framework by the end of the period 2012-2015, as per the directive of the WMO Congress. Yet WIGOS implementation will continue beyond 2015 through the governance and management mechanisms established by the execution of this plan.

The WIP also addresses a number of additional activities that would substantially improve the operational capabilities of WIGOS beyond the 2012-2015 Framework implementation; however these activities are dependent on resources in addition to the regular budget. If these activities are not completed, WIGOS can still be considered operational. The resulting system will, however, be less effective in achieving its goals and benefits to Members will be reduced or delayed.

The WIP provides a basis for the development of the Regional WIGOS Implementation Plans (R-WIP). The Members of a Region will adhere to the global WIP and to their regional framework (R-WIP) in the design, operation, maintenance and evolution of their national observing systems.

This plan is laid out in several chapters that identify and describe the various activity areas to be addressed within this Region. Specific regional/national activities for each area are included in Table 2 (see Section 4), which identifies deliverables, timelines, responsibilities, costs and risks, and whether the activity requires regional and/or national implementation. Similar activities are grouped under the title corresponding to the respective sub-section of Section 2.

1.2 WIGOS Vision and Congress Guidance for WIGOS Implementation

The Sixteenth World Meteorological Congress decided that enhanced integration of the WMO observing systems should be pursued as a strategic objective of WMO and identified this as a major expected result of the WMO Strategic Plan[1].

The WIGOS vision calls for an integrated, coordinated and comprehensive observing system to satisfy, in a cost-effective and sustained manner, the evolving observing requirements of Members in delivering their weather, climate, water and related environmental services. WIGOS will enhance the coordination of WMO observing systems with those of partner organizations for the benefit of society. Furthermore, WIGOS will provide a framework for enabling the integration and optimized evolution of WMO observing systems, including of WMO's contribution to co-sponsored systems. Together with the WMO Information System (WIS), this will allow continuous and reliable access to an expanded set of environmental data and products, and associated metadata, resulting in increased knowledge and enhanced services across all WMO Programmes.

[1] see http://www.wmo.int/pages/about/documents/1069_en.pdf

The implementation of WIGOS should build upon and add value to the existing WMO observing systems with emphasis on integration of surface- and space-based observations in an evolutionary process to satisfy requirements of WMO and WMO co-sponsored Programmes.

In implementing WIGOS, it is imperative that the current management, governance and support activities be reviewed and aligned with WMO priorities. This alignment will promote cooperation and coordination at the technical, operational and administrative levels.

The integrated satellite systems are an important and unique source of observational data for monitoring of weather, climate and the environment. It is important to further advance instrument intercalibration, data exchange, data management standardization, and user information and training, in order to take full advantage of space-based capabilities in the context of WIGOS.

WIGOS will be essential for the Global Framework for Climate Services (GFCS), aviation meteorological services, disaster risk reduction, and capacity development, each of which is a WMO priority. It will also ensure a coordinated WMO contribution to the co-sponsored GCOS, GOOS, GTOS, and to the Global Earth Observation System of Systems (GEOSS).

2. KEY ACTIVITY AREAS FOR REGIONAL WIGOS IMPLEMENTATION

The component observing systems of WIGOS comprise the Global Observing System (GOS), the observing component of the Global Atmosphere Watch (GAW), the WMO Hydrological Observing System (incl. World Hydrological Cycle Observing System (WHYCOS)) and the observing component of the Global Cryosphere Watch (GCW), including their surface-based and space-based components. The above component systems include all WMO contributions to the co-sponsored systems, i.e., GCOS, GOOS, GTOS, as well as the WMO contributions to GFCS and GEOSS.

To migrate the existing observing systems into a more integrated single system that is WIGOS, focused effort is required in the following ten key areas, detailed in the sub-chapters to follow:

(a) Management of WIGOS implementation in RA V;

(b) Collaboration with the WMO co-sponsored observing systems and international partner organizations and programmes;

(c) Design, planning and optimized evolution of WIGOS component observing systems at regional, sub-regional and national levels;

(d) Observing System operation and maintenance;

(e) Quality Management;

(f) Standardization, system interoperability and data compatibility;

(g) The WIGOS Operational Information Resource;

(h) Data discovery, delivery and archival;

(i) Capacity development;

(j) Communication and outreach.

2.1 Management of WIGOS Implementation in RA V

WIGOS implementation is an integrating activity for all regional components of the WMO and co-sponsored observing systems: it supports all WMO Programmes and activities.

Executive Council

The WMO Executive Council will continue to monitor, guide, evaluate and support the overall implementation of WIGOS. Following the guidance by Cg-XVI, EC-LXIII established the Inter-Commission Coordination Group on WIGOS (ICG-WIGOS) with a view to providing technical guidance and assistance for the planning, implementation and further development of the WIGOS component observing systems. Progress on implementation of WIGOS will be reported to subsequent sessions of EC.

Regional Association

The Regional association will play the key role in WIGOS implementation in the Region. The Regional Association, through its Working Group on Infrastructure, in particular the Task Team on WIGOS, will coordinate planning and implementation of WIGOS on the regional level taking into account all WMO future priorities, such as GFCS and DRR. The Working Group on Infrastructure, in particular the Task Team on WIGOS, under guidance from ICG-WIGOS, and with the support of the WMO Secretariat including the WIGOS Project Office, will be responsible for:

(a) The development of the Regional WIGOS Implementation Plan (R-WIP);

(b) The integration of WIGOS regional network components; and

(c) The evolution of their regional networks according to the implementation plan for the evolution of global observing systems (EGOS-IP)[2].

R-WIP will also address regional aspects of requirements, standardization, observing system interoperability, data compatibility, data management, Quality Management procedures including performance monitoring and data quality monitoring, and proposed improvements in observing networks/systems. An important role of the Regional Association will be to assess and continuously monitor regional requirements, identify regional gaps and identify capacity development projects within the Region to address those gaps.

The Members of the Region

Members will plan, implement, operate and maintain national networks and observing programmes based on the standards, recommendations and best practices stated in the WMO Technical Regulations, the WIGOS Manual and the respective Manuals of the WIGOS component observing systems (e.g., GOS, GAW, WHyCOS and GCW). They will be encouraged to adopt a composite network approach to their networks and to include the acquisition, and onward transmission, of data from external sources, including NMHSs and other government agencies, the commercial sector and members of the public. A particular area of focus for Members of the Region under WIGOS will be increased attention to site protection and radio frequency spectrum protection.

Plans should also be developed to strengthen cooperation through partnership with different owners overseeing the WIGOS component observing systems within their countries. Specifically, these activities aim to enhance cooperation amongst meteorological, hydrological, marine/oceanographic and academic/ research institutions/services where they are separated at the national level.

Concerning Radio Frequency Spectrum Protection, Members should maintain close coordination with their national telecommunication authorities to register their frequencies for adequate protection, and to defend the availability of frequencies for Meteorology, Climatology and Earth observations, influencing positively the national delegations to the World Radiocommunication Conferences (WRC).

Countries in Region V which are not Members of WMO

[2] http://www.wmo.int/pages/prog/www/OSY/gos-vision.html#egos-ip.

There are countries in RA-V which are not Members of WMO but nevertheless participate in WMO arrangements for data exchange and utilise WMO standards and recommended practices and procedures. These countries will be encouraged to adopt WIGOS standards and recommended practices and procedures.

2.2 Collaboration with the WMO co-sponsored observing systems and international partner organizations and programmes

WIGOS will be an integrated, comprehensive, and coordinated system primarily comprising the surface-based and space-based observing components of the GOS, GAW, GCW, and WMO Hydrological Observing System (WHOS)) (including WHYCOS), including all WMO contributions to GCOS, GOOS and GTOS. It should be noted that in contrast to the primarily NMHS-owned observing systems upon which the WWW was built, the proposed WIGOS component observing systems are owned and operated by a diverse array of organizations, both research and operational. Therefore, the interaction between these various communities at the regional and national levels is important for the implementation of WIGOS within the Region. In particular, strengthening the interaction between research and operational observing communities is important for sustaining and evolving observing systems and practices, in line with new science and technology outcomes. WIGOS is a major observing component of GFCS and also provides indispensable contributions to GEOSS.

Partner Organizations

At the Regional level, coordination and cooperation will be supported by a mechanism to be defined by the Regional Association and the respective Regional bodies, such as SOPAC[3], SPREP[4], its PMC[5], and ASEAN[6] in order to resolve possible problems in data policy, product delivery and other governance issues. This interagency and inter-observing system coordination mechanism will need to be complemented and supported through similar cooperation and coordination arrangements among NMHSs and through national implementation mechanisms for GFCS, GCOS, GOOS, GTOS, and GEOSS.

The Architecture for Climate Monitoring from Space has been defined as an end-to-end system, involving the different stakeholders including operational satellite operators and R&D space agencies, the Coordination Group for Meteorological Satellites (CGMS), the Committee on Earth Observation Satellites (CEOS), the Global Climate Observing System (GCOS), the World Climate Research Programme (WCRP) and the Group on Earth Observations (GEO). Within the Regional context, the Architecture shall be part of the space-based component of WIGOS. Therefore, particular emphasis will be placed on their coordinated contribution to WIGOS within the Region, building on existing coordination mechanisms stated above.

2.3 Design, Planning and Optimized Evolution of WIGOS component observing systems at regional, sub-regional and national levels

The WMO has agreed on the Vision for the Global Observing Systems in 2025[7] which provides high-level goals to guide the evolution of the global observing systems during the coming decades. To complement and respond to this Vision, an Implementation Plan for the Evolution of Global Observing Systems (EGOS-IP) was approved by CBS-15 (September 2012). This EGOS-IP focuses on the long term evolution of WIGOS component observing systems, while the WIP focuses on the integration of these component observing systems. Beyond 2015 these plans will provide Members of the Region with clear and focused guidelines, specifying actions that stimulate

[3] Applied Geoscience and Technology Division of the SPC (Secretariat of the Pacific Community)
[4] Secretariat of the Pacific Regional Environment Programme
[5] Pacific Meteorological Council
[6] Association of Southeast Asian Nations
[7] Available from the WMO Website at: http://www.wmo.int/pages/prog/www/OSY/gos-vision.html

the cost-effective evolution of the observing systems to address in an integrated way the requirements of all WMO Programmes and relevant parts of co-sponsored programmes.

Concerning the surface-based sub-system of WIGOS, the current composition of mainly separate networks of observing stations comprises numerous different types of sites. With the implementation of WIGOS, these separate networks will continue to evolve but will also be given a more prominent collective identity as the WIGOS surface-based sub-system and for some purposes may be considered as a single composite system of observing (fixed or mobile) sites/platforms. The Regional Association will adopt a broader role in coordinating the implementation of relevant elements of the WIGOS surface-based sub-system, evolving from the previous concepts of mainly the Regional synoptic and climatological networks into an integrated concept of a WIGOS Regional Network.

Similarly, the space-based sub-system of WIGOS is composed of many different platforms and types of satellites. There is already partial integration due to the existence of a globally coordinated plan, which is maintained by WMO and CGMS, and which takes into account the needs of a number of application areas. However, it should be further developed and expanded to better support certain application areas that, at present, are not benefiting from the full potential of space-based observations, for example, other components of GAW and WHOS and new initiatives like GFCS and GCW. In addition, further integration shall be pursued in terms of inter-calibration, data and product harmonization, and composite product delivery. The Regional Association will adopt an active role in compiling the views of Members and maintaining documented requirements and priorities for data and products to be available for the Region from the WIGOS space-based sub-system.

Rolling Review of Requirements (RRR)[8]

Coordinated strategic planning at all levels will be based on the RRR process, and will be supported by the WIGOS regulatory material. This activity will be carried out primarily at the **global level** under the guidance of the ICG-WIOS.

The RRR process involves regularly reviewing the observational data requirements[9] for each of the defined WMO Application Areas and all required variables (see Table 1). The RRR process also involves reviewing the capabilities of WMO observing systems and co-sponsored systems, and the details of the networks/platforms in existence[10], for both space-based and surface-based systems, in delivering data on different variables. The comprehensive information collected for the globe on both requirements and capabilities is quantitatively recorded in a database accessible through the Observing Systems Capability Analysis and Review tool (OSCAR[11]) of the WIGOS Operational Information Resource (WIR, see section 2.7 below). The information on surface-based networks and instrumentation details is currently recorded in the WMO Publication No. 9, Volume A, but will ultimately be available, with additional metadata through OSCAR. Space-based capabilities are also recorded and made available through OSCAR. OSCAR allows the performance of gap analyses to identify weaknesses in existing observing programmes.

The above steps represent the analysis phase of the RRR, which is as objective as possible. Next is the prioritization and planning phase of the RRR in which experts from the various application areas interpret the gaps identified, draw conclusions, identify key issues and priorities for action.

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[8] Currently specified in the *Manual on the Global Observing System* (WMO-No. 544), elaborated in the *Guide to the Global Observing System* (WMO-No. 488), and described further on the WMO Website at http://www.wmo.int/pages/prog/www/OSY/GOS-RRR.html

[9] The RRR describes data requirements, which are expressed in terms of space/time resolution, uncertainty, timeliness, etc., for each of the required observed variables, and are measures independent of observing technology.

[10] Capabilities are derived from the individual platforms characteristics submitted by Members to WMO e.g. through WMO No. 9, Volume A, or its evolution

[11] The following components are currently available via the WMO website: User Requirements: http://www.wmo.int/pages/prog/www/OSY/RRR-DB.html; and Space-based capabilities: http://www.wmo.int/pages/prog/sat/gos-dossier_en.php. The surface-based capabilities part is currently under development

This input is composed as Statements of Guidance (SoG) from each application area. The technical commissions respond to the SoG by formulating new global observing system requirements and the regulatory and guidance publications to assist Members in addressing the new requirements. Additionally, CBS and other technical commissions draw on the SoGs to develop a Vision and an Implementation Plan for further developments of WIGOS.

Table 1: The 12 recognized WMO Application Areas

No	Application Area	No	Application Area
1	Global NWP	7	Ocean Applications
2	High Resolution NWP	8	Agricultural Meteorology
3	Nowcasting & Very Short-range Forecasting	9	Hydrology[12]
4	Seasonal to Inter-annual	10	Climate Monitoring
5	Aeronautical Meteorology	11	Climate Applications
6	Atmospheric Chemistry	12	Space Weather

At the Regional Level

Although the primary coordination of the RRR will lie with CBS for overall WIGOS planning, the Regional Association, through its Working Group on Infrastructure, will follow the technical guidance of the technical commissions as represented in the EGOS-IP and other observation system implementation plans in order to evolve and implement observing systems in the Region.

The Regional Association will examine, and report back to CBS, its requirements for data, and any issues it identifies with the global WIGOS design, taking into account the particular requirements of the Region and international river basin authorities. This process will involve, in essence, (1) the use of the global data to prepare Regional data requirements, (2) use of this for detailed planning of observing system components at the Regional scale and then (3) encouragement of Members of the Region to implement these components, subject to further review at the national or sub-regional level, where appropriate.

In Region V, a Strategic Operating Plan 2012-2015 was composed to respond to the WMO Strategic Plan and document the Regional key priorities. Drawing in part on that document, the Pacific region countries prepared a Pacific Islands Meteorological Strategy 2012-2021 (PIMS).

It is already recognised that there are requirements for improved coordination and collection of observations related to lightning, marine coverage, upper air systems including sustainable balloon programs and AMDAR and affordable and reliable access to satellite data and products.

Region V includes many small island countries separated by vast ocean areas. Surface-based observing networks are consequently relatively sparse. Hence there is a unique level of requirement for satellite products and reliable communications.

At the National or Sub-Regional Level

The Members of the Region will contribute to the collective Regional effort to (1) assess the Regional data requirements and plan the Regional observing system components, and (2)

[12] Hydrological information only; water quality monitoring and information is currently excluded.

implement and evolve observing systems following this plan, the EGOS-IP and other observation system implementation plans.

The Members of the Region will also have available the global and regional data requirements information available to use as guidance for the preparation of national requirements information which can then be used to assist with the detailed planning for evolution of national observing components of WIGOS.

In some cases, where countries are small and geographically close or already have established multilateral working relationships, there may be more merit in taking a sub-regional, as opposed to national, approach to WIGOS observing infrastructure planning. In this case, it will be necessary for the Members concerned to work in close cooperation to prepare sub-regional reviews of requirements to be used as a basis for detailed planning at that scale.

In region V, many pacific countries collaborate through the Pacific Meteorological Council (PMC) and several countries collaborate through the ASEAN Sub-Committee on Meteorology and Geophysics.

2.4 Observing System Operation and Maintenance

Observing system owners or custodians are responsible for operating and maintaining their systems and for complying with the regulations of the WMO and co-sponsored observing systems to which they contribute. System owners are generally NMHSs or other organizations within WMO Member countries but are sometimes other entities.

WIGOS on the Regional level involves a process for sharing of operational experiences, practices and ideas, for sharing of expertise and for pooling resources for joint activities. The benefit is to realize synergies and greater efficiencies. These interactions may be between different teams within a single organization (such as an NMHS) or between Regional organizations. These may benefit from technical guidance from relevant technical commissions and, while occurring primarily at a national level, there is a Regional role to be played.

Efforts also need to be made to identify opportunities to benefit from sharing (of experiences, practices and ideas, expertise and joint activities) across regions (particularly with RA II as well as with other RAs).

Within Regional Association V, the following regional activities provide examples:

- CBS Lead Centre for GCOS
- SOPAC Sea Level monitoring program.

2.5 Quality Management

The Region recognizes that meeting the quality requirements and expectations of users will be critical to the success of WIGOS. This will require an in-depth examination of current practices used by WMO observing programmes, specific mission-related requirements that are already in place, and available technological opportunities.

The WIGOS Quality Management approach is to apply the WMO QMF to the WIGOS component observing systems (see WMO Technical Regulation, WMO-No. 49, Vol. IV). WIGOS quality management at the Regional level will strive for compliance of all components of WIGOS with international standards, such as ISO 9001.and ISO 17025. Compliance with international standards and recommendations should be pursued in all quality assurance (QA) procedures applied by Members of the Region to all their national WIGOS component observing systems. In addition to the WMO QMF document, further guidance to Members will be provided by WMO via

the standards, recommendations and best practices described in the Regulatory Materials, such as the WIGOS Manual and Guide. Such guidance, for both mandatory and desirable practices, can be referred to for the application and implementation of quality management in national observing systems. In this context, the Region will give attention to:

(a) The examination of current quality management practices being used in the Region;

(b) The documentation of the quality of observations from the WIGOS Regional networks at all stages of data processing; and

(c) Ensuring, where possible, traceability of observations to the International System of Units (SI).

CGMS, in coordination and collaboration with WMO, supports the development of quality assurance standards, recommendations and formats for satellite observations, multi-satellite and multi-sensor algorithms for estimating retrieved data and products, and advanced atmospheric sounding derivation packages for use by WMO Members. To assist this effort, the Region will ensure that surface-based sites that are needed for calibration/validation of satellite data are specified.

A key aspect of Regional WIGOS quality management that requires particular attention is the systematic and rigorous performance monitoring and evaluation (PM&E) of WIGOS capabilities, in terms of both: (a) the flow of observational data/products to models; and (b) provision of products/ information for decision-support tools and services in accordance with requirements specified by end users. Effective PM&E can improve the overall performance of WIGOS and its ability to effectively interact with its user community and to meet community needs and requirements.

Members of the Region will be responsible for ensuring compliance with the WIGOS quality management principles (such as ISO 9001, 17025).

2.6 Standardization, System Interoperability[13] and Data Compatibility

The WIS has an important role in Regional WIGOS implementation, in relation to data exchange and discovery, and the provision of effective standards and recommendations for data management. Therefore, the Region will coordinate WIGOS and WIS implementation activities.

Taking into account the ongoing rapid progress in technology that will continue to provide a basis for further improvements in the capability, reliability, quality and cost-effectiveness of observations, the Members of the Region will ensure that WIGOS utilizes international standards, recommendations and best practices set by WMO and partner organizations and described in the WMO Regulatory Materials in the following areas:

(a) Instruments and methods of observation across all components including surface-based and space-based elements (observations and their metadata);

(b) WIS information exchange, as well as discovery, access and retrieval (DAR) services; and

(c) Data Management (Data Processing, Quality Control, Monitoring and Archival).

The Region will support all activities leading to the interoperability (including data compatibility) of WIGOS component observing systems through utilization and application of the same, internationally accepted standards, recommendations and best practices (that is, standardization). Data compatibility will also be supported through the use of standardized data representation and formats.

[13] Interoperability is a property referring to the ability of diverse systems to work together (inter-operate)

Any Regional deviations from the standard practices (documented in the WMO Technical Regulations through the WIGOS Manual and other relevant Manuals) will be reported to the Secretary General (under Article 9 of the Convention of the World Meteorological Organization).

2.7 The WIGOS Operational Information Resource

The WIGOS Operational Information Resource (WIR), accessible via a centralized point (web portal), will provide seamless access to all WIGOS related operational information, including observational user requirements, a description of the contributing observing networks (instrument/site/platform metadata), and their capabilities, list of standard and recommended practices and procedures used in the WIGOS framework, data policies applicable, and information on how to access data. It will also provide general information on WIGOS benefits, and impacts to Members. It will be a tool for conducting critical reviews as part of the Rolling Review of Requirements, and can assist Members and the Regional Association in conducting observing network design studies as appropriate. It will provide guidance on how to develop capacities in developing countries according to WIGOS requirements, and will provide Members of the Region with a toolbox to be used nationally if and when required. The information collected is intended in particular to identify the gaps in the observational networks, identify areas where existing observing systems could be used, or where their scope could be expanded at limited cost to address the requirements of more application areas. The information provided on standard and recommended practices and procedures will support the production of more homogeneous data-sets and make the observations traceable and of known quality.

The key support tools of WIGOS are: (a) a central web portal (WIGOS Portal); (b) The WIGOS "Standardization of Observations" Reference Tool (SORT); and (c) the Observing System Capabilities Analysis and Review tool (OSCAR) which includes information on observational user requirements and observing systems capabilities, and allow to perform the critical review by comparing the two. *[For more information on each of these support tools, please refer to the WIP.]*

Understanding that sources of the individual components of the WIGOS Operational Information Resource rely on the inputs from its Members, the Region is committed to provide regular inputs to keep the information resource up-to-date.

2.8 Data Discovery, Delivery and Archival

Within the WIGOS framework, the WMO Information System (WIS[14]) provides exchange of data and interpretation metadata[15], and management of related discovery metadata[16]. These discovery metadata play an important role in the discovery, access and retrieval of WIGOS observations and products by the entire WMO community.

Submission, management and archival of the data themselves is generally the responsibility of observing system owners/data custodians. However, several World Data Centres and a number of regional or specialized data centres exist that collect, manage and archive basic observational data that are relevant to WMO Applications. Members of the Region are responsible for submitting their data to these regional or specialized data centres. The Regional Association will encourage its Members to abide by this commitment.

Members of the Region will adopt WIGOS and WIS standard and recommended practices and procedures and make their data and metadata available through WIS for delivery or for discovery, access and retrieval services. In this regard, promotion and implementation of DCPCs (Data Collection and Production Centres) as well as National Centres will be supported and encouraged

[14] http://www.wmo.int/wis
[15] Interpretation metadata is the information required to interpret the data
[16] Discovery metadata is the information describing the data-sets, generally using ISO-19115 standard, and WMO core profile in case of WIS

by the Regional Association. Guidance will be developed and provided through the appropriate WIGOS regulatory and technical documents.

2.9 Capacity Development

A coordinated capacity-development effort at global, regional and national levels is of paramount importance to the developing countries in the implementation of WIGOS. This is especially the case for NMHSs of Least Developed Countries (LDCs) and Small Island Developing States (SIDS), to enable them to develop, improve and sustain national WIGOS component observing systems. This needs to be complemented by capacity development efforts outside of WIGOS but in closely related areas to improve access to and effective utilization of observations, data and products, and related technologies. The WIGOS capacity development activities at the Regional level are focused on:

(a) Providing assistance to Members of the Region to introduce or improve institutional mandates and policies and obtain sufficient resources to enable effective implementation, operation and management of observing systems;

(b) Filling the existing gaps in the design, operation and maintenance of WIGOS component observing systems, including both the infrastructure and human capacities development;

(c) Technological innovation, technology transfer, technical assistance and decision-support tools.

In RA-V, it is important to promote the training needs identified in collaboration with Member countries with respect to WIGOS.

Capacity development in satellite applications for developing countries, LDCs and SIDS are also addressed in the Implementation Plan for the Evolution of the GOS (see WMO/TD-No. 1267). The virtual lab (VL) will continue to grow and help all WMO Members realize the benefits of satellite data.

2.10 Communication and Outreach

The Region will establish its communication and outreach strategy through the efforts of WMO Members, Programmes, Regional Associations (RAs) and Technical Commissions (TCs), and co-sponsors. The strategy will provide details on WIGOS benefits, increased effectiveness, and efficiency, and impact on the activities of the Members of the Region, as well as on the socio-economical benefits of WIGOS data. It will take advantage of outreach programmes developed and effectively deployed so far by WMO and its partner organizations within the Region.

The WIGOS Portal will provide convenient access to relevant information on the Regional communication, outreach and capacity development, aimed at complementing, not duplicating, others' efforts. A variety of outreach materials will be developed to educate the Members, funding agencies, policy-makers and the general public, on the importance of WIGOS to society. Materials will include posters and other educational material for elementary and high school classes, a WIGOS brochure, a semi-annual or annual newsletter, an online photo and video library, and information on the current state of the observing systems.

Key stakeholders in each country include the national government and other funding agencies. The Regional Association will assist NMHSs to build communication with their Government and make effective proposals for increased support of observing systems. Such proposals need to enlighten Government of the significant benefits of providing increased support for meteorological services, in particular observing systems. Where appropriate, the Regional Association will build communication with international funding agencies and make effective proposals for support of observing systems in the Region.

3. REGIONAL PROJECT MANAGEMENT

The Regional Association will be responsible for the Project through Working Group on Infrastructure, in particular the Task Team on WIGOS, with support from the Regional Office for Asia and the southwest Pacific, and the WMO office for the southwest Pacific.

3.1 Monitoring, review and reporting mechanism

(a) The Regional Association, through its Management Group, will monitor, review, guide and support the overall implementation of WIGOS in the Region, and update the Implementation Plan if and when necessary;

(b) The Regional Association, through the chair of the Working Group on Infrastructure, will report to the ICG-WIGOS and the WIGOS Project Office on the progress in implementation of WIGOS in the Region;

(c) The President will report at the RA's sessions on WIGOS implementation.

3.2 Evaluation

The evaluation methodology will be designed against WIGOS implementation activity tables, i.e. with respect to the activities, deliverables, timeline, responsibility and budget allocations. This will include a schedule of monitoring and evaluation activities and related responsibilities. Mid-term evaluation, interim progress reports and post-implementation reviews are planned as a means of providing early feedback on progress towards success, and as a means of meeting accountability and transparency requirements for the whole implementation phase. RAs and NMHSs will provide progress reports at the request of the WIGOS Project Office.

4. Implementation

4.1 Activities, Deliverables, Milestones, Costs and Risks

Table 2 presents the key implementation activities that are required for the Regional WIGOS implementation within the timeframe 2012-2015. The table is arranged to correspond to the activity areas presented in Section 2. In the table each implementation activity is presented along with its associated deliverables, timelines, responsibilities, costs and associated risk.

For each activity in Table 2, a detailed activity plan will be developed by the responsible entity or entities, with support of Working Group on Infrastructure. The Working Group on Infrastructure has responsibility for tracking execution of these activities and this plan itself.

Table 2 WIGOS Implementation Activities (Region V)

Activities in bold are considered the most critical for WIGOS to gain operational acceptance by 2015.
Depending on the implementation scale, planned activities are specified as follows: **R** = Regional activity and **N** = National activity.
Key to activity numbers: **a.b.c**, where **a** is number of respective sub-section of section 2, **b** is for a regional (2) or national (3) activity, and **c** is a sequential number to distinguish activities from one another. ARB = Available Regular Budget. RB = Regular Budget.

No.	Activity	Deliverables	Timeline	Responsibility	Estimated Costs (2012-2015) K CHF	*Potential Risks*[1]
						Low/Mod/High
1. Management of WIGOS Implementation in Region V						
1.2.1 R	Develop the Regional WIGOS Implementation Plan for Region V (R-WIP-V)	Regional WIGOS Implementation Plan for Region V (R-WIP-V)	2012-13	Drafting by WG-Infrastructure (TT-WIGOS), adoption by President RA-V		Low
1.2.2 R	Compile information from Member countries, other relevant partners and WMO sources as input to a "stock-take" of existing WMO observing systems in RA-V.	A report detailing all the current WMO observing systems in Region V, including the composition of networks, data outputs and who the owners/operators are.	2013	WG-Infrastructure (TT-WIGOS) assisted by Secretariat		High
1.2.3 R	Assess the EGOS-IP and other WMO observing system implementation plans to identify actions relevant to RA-V and Member countries; assign priorities to these actions.	Prioritised list of actions for RA-V and for Members arising from the EGOS-IP and other IPs.	2012-13	Drafting by WG-Infrastructure (TT-WIGOS), adoption by President RA-V		Low
1.2.4 R	Provide an effective RA-V focal point to liaise with CBS about the implementation of EGOS-IP in RA-V.	An effective RA-V focal point for EGOS-IP, who is actively corresponding with CBS.	2012-15	RA-V MG, focal point for EGOS-IP		Mod
2. Collaboration with WMO and co-sponsored observing systems						

[1] A simple rating of "risk" is registered in this plan for each activity, using the scale Low/Medium/High to represent the combined assessment of the likelihood of not fully completing the activity and deliverable/s as intended, plus the consequential impact of such non-completion. More detailed risk assessment, including mitigation where warranted, is needed when more detailed planning is undertaken for each activity.

2.2.1 R	Identify and engage further potential partners for collaboration in the collection of observations on a Regional scale. Clarify the target area/s for collaboration and the mechanism for resolving governance issues.	A report on existing partnerships on a Regional level, to provide a baseline and reference,	2012-15	WG-Infrastructure (TT-WIGOS).		Mod
2.3.1 N	Encourage Member countries to identify and engage further potential partners in the collection of observations for WMO programs. Clarify the target area/s for collaboration and the mechanism for resolving governance issues.	Increased number of collaborating partners at a National level and increased collection of observations.	2012-15	Encouragement by MG, action by all Member countries in RA-V.		Mod
2.2.2 2.3.2 R, N	Collaborate with CIMO to develop a *reliable feedback mechanism* on the performance of instruments and systems in Region V. Provide feedback regularly.	A status report is provided to RA-V and CIMO on progress of meteorological observing systems against WMO regulations (standards and recommendations).	2013	WG-Infrastructure (TT-Traceability) develop mechanism, Member countries in RA-V provide feedback.		Mod
3. Design, planning and optimized evolution of WIGOS component observing systems **at regional, sub-regional and national levels**						
3.2.1 R	Design and plan observing systems in the Region, taking into account: (i) the technical guidance of the technical commissions as represented in the EGOS-IP and other observation system implementation plans; (ii) the Regional priorities adopted by President RA-V (see action item 1.2.3); (iii) relevant actions identified in the Technical Plan of the Tropical Cyclone Committee for the South Pacific and South-East Indian Ocean; (iv) the need for "gap filling" and restoration of silent stations; and (v) cross-regional coordination opportunities.	Improved WMO observing system design in Region-V.	2012-15	Coordination by WG-Infrastructure (TT-WIGOS).		High

3.3.1 N	Evolve and implement National observing systems, taking into account: (i) the technical guidance of the technical commissions as represented in the EGOS-IP and other observation system implementation plans; (ii) the Regional priorities adopted by President RA-V (see action item 1.2.3); (iii) relevant actions identified in the Technical Plan of the Tropical Cyclone Committee for the South Pacific and South-East Indian Ocean; (iv) the need for "gap filling" and restoration of silent stations.	Improved WMO observing systems in Region-V.	2012-15	Member countries in Region V.		High
3.2.2 R	Define and describe the Regional WIGOS Network (building on action item 1.2.2) as the collective identity for all WMO observing systems in Region V.	A report to convey the definition and description of the Regional WIGOS Network.	2014	WG-Infrastructure (TT-WIGOS).		High
3.2.3 R	Validate the user requirements documented by the global RRR process against Regional user requirements; use the results to update the RRR user requirements database and to fine tune the EGOS-IP and observing system plans.	WMO observing systems are responsive to Regional user requirements.	2013-15	WG-Infrastructure (TT-WIGOS).		Mod
3.3.2 N	Validate the user requirements documented by the global RRR process against National user requirements for WMO systems; use the results to update the RRR user requirements database and to fine tune the EGOS-IP and observing system plans.	WMO observing systems are responsive to National user requirements for WMO systems.	2013-15	Member countries in Region V.		Mod

4. Integrated Observing System Operation and Maintenance						
4.2.1 R	Compile, from Member contributions, a set of examples of integrated operation and maintenance between observing system owners/operators, covering the sharing of experiences, practices and ideas, the sharing of expertise and the pooling of resources for joint activities; noting specifically that: (1) training is an effective way to share knowledge and skills; (2) funding for capacity development is often the trigger which enables increasingly integrated approaches. Promote this report amongst Member countries as a stimulus for thinking broadly about opportunities to benefit from integration.	A report providing examples of integrated approaches to operation and maintenance.	2013	WG-Infrastructure (TT-WIGOS).		low
4.2.2 R	Capacity development in data communication techniques related to observations collection and reporting	Reference material, case studies and training, leading to enhanced capacities	2013-15	WG-Infrastructure (TT-PSC)		
4.2.3 R	Capacity Building in Radar Techniques in Southeast Asia, supported by appropriate technical missions to countries, through: • All the ASEAN developing countries will prepare a national report on their arrangements for the operational use of weather radar data; and • A sub/cross-region (for the ASEAN developing countries) strategic plan for addressing technical issues and necessary actions identified in the national reports.	Enhanced capacity in monitoring and forecasting of severe weather using radar data.	2013-15	Those Member countries involved in the sub-Regional /cross-Regional (with RA-II) ASEAN Sub-Committee on Meteorology and Geophysics		Mod
5. Integrated Quality Management						

5.2.1 R	Progressively achieve traceability to SI standards of measurements made throughout RA V, focusing initially on surface pressure, temperature, precipitation, humidity, also sea level.	Traceable observations from progressively more components of the Regional WIGOS Network.	2012-15	WG-Infrastructure (TT-Traceability), in collaboration with the RICs and Members.		Mod
5.2.2 5.3.1 R, N	Develop a self-assessment tool to enable Members to follow CIMO guidelines for observations	Self-assessment tool.	2014	WG-Infrastructure (TT-Traceability), with input from Members.		High
5.2.3 R	Actively review and respond to the findings of CBS' periodic data flow monitoring exercises.	An active review process.	2012-15	WG-Infrastructure (TT-WIGOS).		Low
5.2.4 R	Find new means of continuous monitoring of observations data quality in Region V with the support of Centres of the GDPFS (Global Data Processing and Forecasting System).	Request is made (for the systemic errors in observations from the analysis scheme) and collaboration is established with Chair OPAG-GDPFS on this topic.	201x	WG-Infrastructure (TT-WIGOS), in collboration with Centres of the GDPFS.		Mod
6. Standardization, System Interoperability and Data Compatibility						
6.2.1 R	Achieve the migration to Table Driven Code Forms throughout Region V as specified by CBS.	Completed migration to Table Driven Code Forms throughout Region V.	2014	WG-Infrastructure (TT-TDCF).		Mod
6.2.2 R	Develop a process to monitor and report on what Members currently do in relation to compliance with WIGOS standards and recommendations.	A process is developed to monitor and report on what Members currently do in relation to compliance with WIGOS standards and recommendations.	20xx	WG-Infrastructure (TT-WIGOS).		Mod

6.2.3 R	Review and suggest requirements for new WIGOS standards, recommendations and/or regional best practices.	Proposals for new WIGOS standards, recommendations and/or regional best practices.	20xx	WG-Infrastructure (TT-WIGOS).		Mod
6.2.4 6.3.1 R,N	Implement the WMO Siting Classification Scheme in RA V, through: • Provision of information and training to Member countries, and • Adoption of new procedures by Member countries.	WMO Siting Classification Scheme is implemented in RA V.	201xxx	WG-Infrastructure		high
6.2.5 R	Determine capacity of WMO Members in RA-V to maintain and submit to WMO interpretation metadata (as currently required for Vol.A)	Report on the capacity of WMO Members in RA-V to maintain and submit to WMO interpretation metadata (as currently required for Vol.A)…	2014	WG-Infrastructure (TT-WIGOS).		Mod
7. The WIGOS Operational Information Resource (WIR)						
7.2.1 R	Request, support and encourage Members to provide up-to-date metadata to the WIR and ensure its ongoing maintenance.	Up-to-date metadata maintained at WMO.	201x- (dependent on completion of database)	WG-Infrastructure (TT-WIGOS).		Mod
8. Data discovery, delivery and archival						
8.2.1 R	Foster increased exchange of observations data and discovery metadata using WIS in the Region, through awareness raising and provision of guidance for the adoption of WIS standards and recommendations, including implementation of Data Collection and Production Centres (DCPC) and National Centres (NC), in collaboration with GISC Melbourne.	Increased provision of "discovery metadata" hence accessibility of data through the WIS.	2012-15	WG-Infrastructure (TT-WIS).		Mod
8.2.2 R	Encourage Member countries to share data via the WIS, including from organizations other than NMHSs.	New sources of data are available through the WIS.	2012-15	WG-Infrastructure (TT-WIS).		Mod

9. Capacity development[1]						
9.2.1 R	Assist Member countries to introduce or improve institutional mandates and policies, and obtain sufficient resources, relating to observing systems.	Improved institutional mandates and policies in Member countries and increased resources relating to observing systems.	2012-15	Management Group, supported by TT-WIGOS.		Mod
9.2.2 9.3.1 R, N	Assist Members to fill gaps (infrastructure & human capacities) in their WIGOS component observing systems, in particular: Assist Fiji to fully implement and sustain their calibration facilities (end of 2013);	Gaps (both infrastructure and human capacities) in the WIGOS component obs systems of Member countries identified/filled.	2012-15	WG-Infrastructure (TT-WIGOS, TT-TO), in collaboration with Regional partners and Members.		Mod
10. Communication and outreach						
10.2.1 R	Contribute to WIGOS communication and outreach across Region V by: (i) responding to the role defined in the ICG-WIGOS communication strategy; **(ii)** utilising material provided by WIGOS-PO to raise awareness and commitment to WIGOS in Region V.	Effective communication and outreach for WIGOS across Region V.	2012-15	WG-Infrastructure (TT-WIGOS) and Management Group.		Low
10.3.1 N	Contribute to WIGOS communication and outreach within Member Countries by: (i) responding to the role defined in the ICG-WIGOS communication strategy; **(ii)** utilising material provided by WIGOS-PO to raise awareness and commitment to WIGOS in Region V.	Effective communication and outreach for WIGOS within Member countries.	2012-15	WMO Member countries in Region V.		Low

[1] Congress stressed that an effective capacity-building strategy is an essential component of the WIGOS implementation. Specialized education, training activities and improvement of necessary observing infrastructure should be reflected in the regional, sub-regional and national WIGOS implementation plans, especially for NMHSs of LDCs, LLDCs and SIDS. Hence, capacity building is not to be limited to scientific and technological concerns, but also to strategic and management consideration including human resources development, resource mobilization and communications and outreach activities.

5. Resources

The activities for implementation of the WIGOS framework will be completed through resources of:

- the experts conducting the work of WG-INFR and its Task Teams;
- Member countries and their efforts to implement WIGOS;
- Partner bodies;
- Capacity development initiatives.

Specific resources required for each activity will be identified when specific detailed planning is undertaken for each activity.

6. Risk AsseSsment/ Management

The Risk Management Plan (RMP) will be developed for each implementation activity/projects, including risk mitigation. The following risk areas have been identified:

(a) Awareness

The communication and outreach strategy for WIGOS in the Regions and Member countries is not very clear and does not appear to have been progressed greatly yet. Increased resources in the WIGOS Project Office might help to address this. Part of this effort is development of materials, including materials suitable for RA-V.

The WIGOS framework Checklist for Members might contribute as an awareness raising device in addition to a self-assessment tool.

(b) Coordination and Commitment

There is a need for alignment and coordination between the R-WIP-V and other plans. That applies to other WMO plans as well as plans of other agencies for meteorological development in the region (for example the Pacific Islands Meteorological Strategy). The commitment to any activities and the attention of donor agencies will be strengthened if alignment & coordination is achieved.

(c) Resources

Ultimately it is Member countries that must find the resources to implement and operate systems identified by some of the WIGOS framework activities. This is a significant challenge which calls for attention to WIGOS capacity development activities and constraint in the demands placed on Member countries.

7. OUTLOOK

This document has described the key activities for the period 2012 to 2015. As determined by Cg-XVI, the goal is to have WIGOS operational by 2016. This is a challenging task. The experience gained during the WIGOS test of the concept phase clearly shows that it will be impossible to complete integration of all observing systems on global, regional and national levels in only four years. While WIGOS operations should start in 2016, there will still be a strong need to continue a significant number of implementation activities.

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LIST OF ACRONYMS

ASEAN	Association of Southeast Asian Nations
CBS	Commission for Basic Systems
CEOS	Committee on Earth Observation Satellites
CGMS	Coordination Group for Meteorological Satellites
CIMO	Commission for Instruments and Methods of Observation
CONOPS	Concept of Operations
DAR	Discovery, Access and Retrieval
DB	Database
DCPC	Data Collection or Production Centre (of WIS)
DRR	Disaster Risk Reduction
EGOS-IP	Implementation Plan for the Evolution of Global Observing Systems
ET	Expert Team (of WMO Technical Commission)
FAO	Food and Agriculture Organization of United Nations
GAW	Global Atmosphere Watch
GCOS	Global Climate Observing System
GCW	Global Cryosphere Watch
GEO	Group on Earth Observations
GEOSS	Global Earth Observation System of Systems
GISC	Global Information System Centre (of WIS)
GFCS	Global Framework for Climate Services
GOOS	Global Ocean Observing System
GOS	Global Observing System
GTOS	Global Terrestrial Observing System
ICG-WIGOS	Inter-Commission Coordination Group on WIGOS
ICPC	Interagency Coordination and Planning Committee for Earth Observations
ICSU	International Council for Science
IOC	Intergovernmental Oceanographic Commission
ISO	International Organization of Standardization
ITU	International Telecommunication Union
LDCs	Least Developed Countries
MOU	Memorandum of Understanding
NMHS	National Meteorological and Hydrological Service
NOS	National Observing System
OSEs	Observing Systems Experiments
OSCAR	WIGOS Observing Systems Capabilities Analysis and Review tool
OSSEs	Observing System Simulation Experiments
PIMS	Pacific Islands Meteorological Strategy 2012-2021

PM&E	Performance Monitoring and Evaluation
PMC	Pacific Meteorological Council (of SPREP)
QA	Quality Assurance
QC	Quality Control
QMF	Quality Management Framework
QMS	Quality Management System
RA	Regional Association
RCC	Regional Climate Centre
RIC	Regional Instrument Centre
RMIC	Regional Marine Instrument Centre
RRR	Rolling Review of Requirements
SIDS	Small Island Developing States
SoG	Statement of Guidance
SOPAC	Applied Geoscience and Technology Division of the SPC (Secretariat of the Pacific Community)
SORT	“Standardization of Observations” Reference Tool (of WIGOS)
SPREP	Secretariat of the Pacific Regional Environment Programme
SLA	Service Level Agreement
TC	Technical Commission
TOR	Terms of Reference
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
WCRP	World Climate Research Programme
WIGOS	WMO Integrated Global Observing System
WIP	WIGOS framework Implementation Plan
WIR	WIGOS Operational Information Resource
WIS	WMO Information System
WHYCOS	World Hydrological Cycle Observation System
WWW	World Weather Watch

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Annex XI

TENTH SESSION OF THE RA V MANAGEMENT GROUP
(Jakarta, Indonesia, 14 to 15 March 2014)

WORLD METEOROLOGICAL ORGANIZATION

REGIONAL ASSOCIATION V (South-West Pacific)

RA-V
WIS IMPLEMENTATION PLAN
2013 - 2015

February 2014

VERSION CONTROL

Version	*By*	*Date*	*Changes*
0.1	WG-INFR	26/04/2013	The RA-VI WIS Implementation Plan was used to guide the structure of the initial draft.
0.2	Weiqing Qu	08/05/2013	Structure developed, partial text completed for review.
0.3	Weiqing Qu	06/08/2013	Draft text completed.
0.4	Russell Stringer, Weiqing Qu	27/08/2013	• Added a version control table • Emphasise the benefits of WIS in RA-V • Inserted contact details for GISC Melbourne • Added Figure 3b and notes/updates to Figures 3,4,5 (further updates are needed) • added information about the AusAID funded project for RA-V WIS implementation, including in-country visits.
0.5	WMO Secretariat	04/02/2014	Minor editorials for submission to RA V-16

CONTENT

1. Executive summary

Benefits for the Member countries of WMO Regional Association V (south west Pacific) arising from the full implementation of WIS (the WMO Information system) will include:

- Continued and enhanced operation of the GTS (WMO's Global Telecommunication System) providing a reliable and timely collection and dissemination service for time-critical and operation-critical data and products;
- In addition to private networks, the GTS will make better use of public communications including the Internet where appropriate, and supported by advanced satellite distribution systems;
- The GTS data management framework will continue to pursue fast and efficient coding practices and data representations;
- A new system of catalogues available through a Global Information System Centre (GISC) portal, enabling online search, discovery and access of available data and products. This facilitates access to a much greater range of current and archived data and products;
- Download or re-runs of GTS data and products published in the past 24 hours;
- Simplified processes for Member countries to update GTS routing and provide information about available data and products.

The WIS Implementation Plan (WIS-IP) is aimed at guiding RA-V Members to implement WIS functionality in their identified centres and to become effective WIS users in a timely and harmonized manner. Therefore, it concentrates on enablement of new WIS functionality by NMHSs as National Centres (NC), i.e. to focuses on helping the members of RA-V to set up National Centres (NC) connected to their principal GISC in the Region. Although the establishment of Data Collection or Production Centres (DCPC) has been mentioned briefly, the implementation detail is not covered by this document, because implementation procedures for DCPCs are documented in the Manual on WIS[1] and WIS Demonstration Process "Procedures and Guidelines"[2].

The WIS-IP outlines: the features of WIS; the benefits for Members to be connected to WIS; the current status of WIS in RA-V; the telecommunication network used for meteorological data and products; then goes on to describe steps for implementation in RA-V. The list of countries in RA-V together with their proposed principal GISC provides an overview of the structure of WIS after its regional implementation. The steps an NMHS has to take to become a WIS NC are described in detail. The initial steps to establish a DCPC are also mentioned. Sample step-by-step implementation approach for these two cases is provided in the Appendices.

Challenges associated with the WIS implementation in RA-V are identified, together with possible remedies. The responsibilities of the GISCs in the WIS implementation monitoring are described with their importance for the successful implementation of the plan. The participation and cooperation of the national WIS Focal Points is stressed. The future activities to implement the plan are listed with the goal that most of the RA-V Members will be WIS enabled by the end of 2015.

Member countries and specifically their national WIS Focal Points are urged to maintain active collaboration with their principal GISC. For many RA-V countries that is GISC-Melbourne for which the contact details are provided in Appendix VI.

[1] Manual on the WMO Information System (WMO No 1060) - http://library.wmo.int/opac/index.php?lvl=notice_display&id=9254
[2] WIS Demonstration Process Guidelines - http://www-db.wmo.int/WIS/centres/guidance.doc

2. Introduction

In 2003, the World Meteorological Congress (Cg-14) stated that an overarching approach for solving the data management problems for all WMO and related international programmes, a single coordinated global infrastructure was required. This solution was named the WMO Information System (WIS) with the following features:

- WIS would be used for the collection and sharing of information for all WMO and related international programmes;
- WIS would provide a flexible and extensible structure allowing the participating centres to enhance their capabilities as their national and international responsibilities grow;
- Implementation of WIS should build upon the most successful components of existing WMO information systems in an evolutionary process;
- WIS development should pay special attention to a smooth and coordinated transition;
- The basis for the core communication network should be the communication links used within the World Weather Watch (WWW) for the high priority real-time data;
- WIS should utilise international industry standards for protocols, hardware and software.

Between Cg-14 (2003) and Cg-15 (2007), good progress was made in demonstrating the technological solutions for WIS through pilots and prototypes projects.

Cg-15 agreed that the WMO Information System should 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.

Cg-15 also emphasized that the WIS implementation should build upon existing WMO information systems in a smooth and evolutionary process. It agreed that the WIS implementation plan should have two parts that would be developed in parallel:

- **Part A:** the continued consolidation and further improvements of the 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 (including improved management of services);
- **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.

Cg-15 further emphasized that the support and involvement of all NMHSs, including regional associations and technical commissions in the WIS development was a crucial factor for ensuring a successful implementation and a shared ownership of the system.

During the period 2007 – 2011, between Cg-15 and Cg-16, under the leadership of the CBS, the development of WIS progressed both in terms of technological solutions and preparation of regulatory and guidance material for its implementation. Thus, Cg-16 (2011) noted the significant progress achieved by Members in implementing WIS with 18 Members/organizations that have entered into the first round of the demonstration process for a total of 13 GISCs and 56 DCPCs (some of these centres had been in pre-operational mode since May 2010). Congress accepted the recommendation by CBS on the designation of the initial set of WIS centres. Congress requested that after the initial designation of WIS centres, further designations will be performed by EC in accordance with the Manual on WIS.

Cg-16 stated that WIS had moved from a development stage into an operational stage and advised Members and relevant international organizations that WIS activities in 2012-2015 should focus on:

a. Complete WIS implementation across all WMO Centres;
b. Capacity building to ensure support of all WMO Members;
c. Leveraging WIS advantages for all WMO Programmes; and
d. Taking advantage of WIS in all WMO Data Management.

Cg-16 became a turning point for intensive global, regional and national planning for the implementation of WIS and emphasized that although the implementation of the new functionality of WIS had been advanced in a few core centres, many Members were yet to begin their implementation. Cg-16 expected that the full implementation of WIS by all Members will take at least the whole of the 2012-2015 financial period.

Congress set-up the following major activities and implementation target dates, urging all Members and the Secretary-General to identify the necessary resources for reaching the objectives:

a. Improving the knowledge and capabilities of Members to benefit from WIS functionality, in particular least developed countries, developing countries and small island states through regional workshops and information sessions: 2012-2013;
b. Implementation of WIS at all NMHS national centres (NCs): 2012-2015;
c. Implementation of remaining candidate GISCs: 2012-2013;
d. Implementation of more DCPCs, i.e. WIS interfaces at WMO Programmes' centres: 2012-2015;
e. Amendments to the Manual on WIS for enhanced operational arrangements of WIS centres, especially GISCs: 2014.

The introduction on WIS presented above shows that the implementation of WIS in the WMO community opens the new chapter for the global data exchange. The benefits for the Member countries of WMO Regional Association V (south west Pacific) arising from the full implementation of WIS will include:

- Continued and enhanced operation of the GTS (WMO's Global Telecommunication System) providing a reliable and timely collection and dissemination service for time-critical and operation-critical data and products;
- In addition to private networks, the GTS will make better use of public communications including the Internet where appropriate, and supported by advanced satellite distribution systems;
- The GTS data management framework will continue to pursue fast and efficient coding practices and data representations;
- A new system of catalogues available through a GISC portal, enabling online search, discovery and access of available data and products. This facilitates access to a much greater range of current and archived data and products;
- Download or re-runs of GTS data and products published in the past 24 hours;
- Simplified processes for Member countries to update GTS routing and provide information about available data and products.

At the 15th session of World Meteorological Organization (WMO) Regional Association 5 (RA-V) in Bali, Indonesia (30 April – 6 May 2010) and the subsequent 4th Session of the RA-V Management Group, the following subsidiary bodies were established:

- Management Group (MG);
- Tropical Cyclone Committee for the South Pacific and South-east Indian Ocean (TCC), Chair, Mr Mike Bergin;
- Working Group on Hydrological Services (WG-HYS), Lead, Dr Arie S. Moerwanto;
- Working Group on Climate Services (WG-CLS), Lead, Mr Erwin E.S. Makur;
- Working Group on Weather Services (WG-WXS), Lead, Mrs Susan O'Rourke;
- Working Group on Infrastructure (WG-INFR), Lead, Mr Russell Stringer.

The objective of the Working Group on Infrastructure (WG-INFR) is to contribute to the improvement of infrastructure (data and information services) for weather, climate and water in Region V through implementation of the WMO Integrated Global Observing System (WIGOS) and WMO Information System (WIS). To achieve this objective, The Task Team on WIS Development and Implementation (TT/WIS) was established.

One of the tasks for TT/WIS is to develop the RA-V WIS Implementation Plan. The WG-INFR had a meeting from 24 – 27 April 2013 in Melbourne (BoM headquarters). The meeting reviewed the current status of GTS/WIS operation, as well as other infrastructure related issues, such as telecommunications in RA-V. The meeting decided to develop the RA-V WIS Implementation Plan (WIS-IP) led by TT/WIS.

In conclusion, the RA-V-WIS Implementation Plan is an all inclusive guiding document for RA-V Members to follow in building an effective and efficient WIS infrastructure, in line with the guidance given by Cg-16 for a fast transition from development to implementation phase of the WIS.

3. Scope and purpose of RA-V WIS Implementation Plan

The RA-V WIS Implementation Plan is aimed at guiding RA-V Members to implement WIS functionality in their identified centres and to become effective WIS users in a timely and harmonized manner. Therefore, it concentrates on enablement of new WIS functionality by NMHSs as National Centres (NC). Included in the scope of this plan is assisting Members to understand the benefits of WIS and convey these benefits to stakeholders.

In order to facilitate the implementation process, RA-V GISCs should establish close contacts with the NCs in their areas of responsibility. They are GISC Melbourne supported by GISCs Washington, Tokyo and Toulouse. In particular, GISCs should act as "help desks" and provide assistance to build the capacity of the NCs to handle the required discovery metadata. Also, the plan states the standards for WIS compliance of NCs for the guidance of Members and their principal GISCs.

The regional dimension of the implementation process is addressed in this WIS-IP. This dimension is important because it facilitates a synchronized and coordinated implementation by all Members and partner organizations of the Region. The existing capacity gaps, both technical and human resource related, could be addressed through the cooperation and assistance mechanisms of the Regional Association, which would accelerate the implementation and bring the expected benefits to all Members.

The Plan also provides practical guidance and a step-by-step approach towards the WIS implementation by Members in their National Centres. A primary task for the NMHSs is ensuring compliance with the WIS requirements established by the WMO regulatory material *WMO Technical Regulations, Volume I (WNO-No. 49)* and its *Annex VII, Manual on the WMO Information System (WMO-No. 1060)*.

4. Description of WIS

WIS is the global infrastructure for managing and making available weather, water and climate information. WIS meets the requirements for routine collection and automated dissemination of observed data and products, as well as data discovery, access and retrieval services for all weather, climate, water and related data and products provided by centres and Member countries in the framework of all WMO Programmes.

4.1 WIS Services

While WIS builds on and extends the GTS, it is also a new approach to data discovery and data provision in the meteorological community. WIS goes far beyond providing telecommunication services, and offers new and modern data management services to its users. These are essentially the possibility to discover all data and products of the wider WMO community, as well as the means and information on how to obtain the data. For this purpose, all information within WIS is described by discovery metadata in accordance to the WMO Metadata Core Profile. It is assumed that WIS by including the GTS and the Internet will have sufficient bandwidth/link capacity available to fulfill future user needs. To this end, WIS provides three types of services:

a. **Routine collection and dissemination service for time-critical and operation-critical data and products:** This service is an extension of the current GTS. It is based on subscription to real-time "push and forward" distribution systems, including multicast and broadcast, and implemented mostly through dedicated telecommunication means providing a guaranteed quality of service. An important component of this service will be the "all hazards warning network" facilitating warnings to be distributed from one point in WIS to all other points within 2 minutes.

b. **Service for the timely delivery of non time-critical, operationally critical or voluminous data and products:** This is a new service which allows users to subscribe to data that would not otherwise have been available through the GTS because it is too voluminous or because the delivery is not so critically time- or operationally- dependent. Thus, the delivery method for these data does not need to use the capacity of the GTS. It is also suitable for those users not connected to the GTS. The service is focused on a "push" mechanism and implemented mostly via public data-communication networks, such as the Internet. As with the time and operationally critical service (1), users may use the discovery service (3) to search for the information they would like to access or subscribe to.

c. **Data Discovery, Access and Retrieval (DAR) service:** This is a new service where the user can use a variety of discovery services to search for data, products or other information registered within the WIS. Depending on the access policy for the data, the user may also access and download the data. The service is based on a request/reply "pull" mechanism and is to be implemented mainly through the Internet, but the user may also subscribe to receive data or products via the GTS or any other delivery mechanism available between the information provider and the user (for example via e-mail, SMS, facsimile, courier or postal services). In this way, WIS users can potentially discover and access all WMO data and products without having an extensive knowledge of the information practices and procedures of the WMO Programme responsible for the data or product. Note that if a user has an account at a GISC, then, depending on the data policy, it may be able to access information directly from the GISC, all of which hold information that is available for global exchange for at least 24 hours.

4.2 The structure of WIS

The WIS services described above are realized by WMO Members and associated centres through three types of WIS centres as well as the WIS data communication network. WIS centres need to be endorsed by WMO in accordance with the regulations described in the WMO Technical Regulations (WMO No. 49) and the Manual on WIS (WMO No. 1060).

The concept of interoperability guarantees that the overall functionality of WIS is realized by each WIS centre through implementing the specifications required for this type of centre. The four core components are:

- Global Information System Centres (GISC)
- Data Collection or Production Centres (DCPC)
- National Centres (NC)
- Data networks

4.3 WIS Centres

GISCs collect and distribute information for routine global dissemination, such as GTS data. They serve as collection and distribution centres in their areas of responsibility and they provide access points for any request for data held within the WIS. A WIS user accessing the web portal of any GISC will be able to browse any data catalogue of information available in WIS.

DCPCs are connected to the GISCs and are responsible for the collection or generation of specialized sets of data, forecast products, processed or value-added information beyond the scope of NCs, and/or for providing archiving services.

NCs collect and distribute data on a national basis and coordinate or authorize the use of the WIS by national users, normally under a policy established by the respective Permanent Representative with WMO.

The terms NC, DCPC and GISC are used for describing the necessary functions, not actual organizational entities. There may be organizations, such as NMHSs, which combine all three functions within their structure. There may be several GISCs in a Regional Association (RA). NCs and DCPCs can be associated with several GISC but have to choose one of the GISCs as their principal GISC for the purposes of uploading and managing discovery metadata. The following diagram provides an overview of the various components:

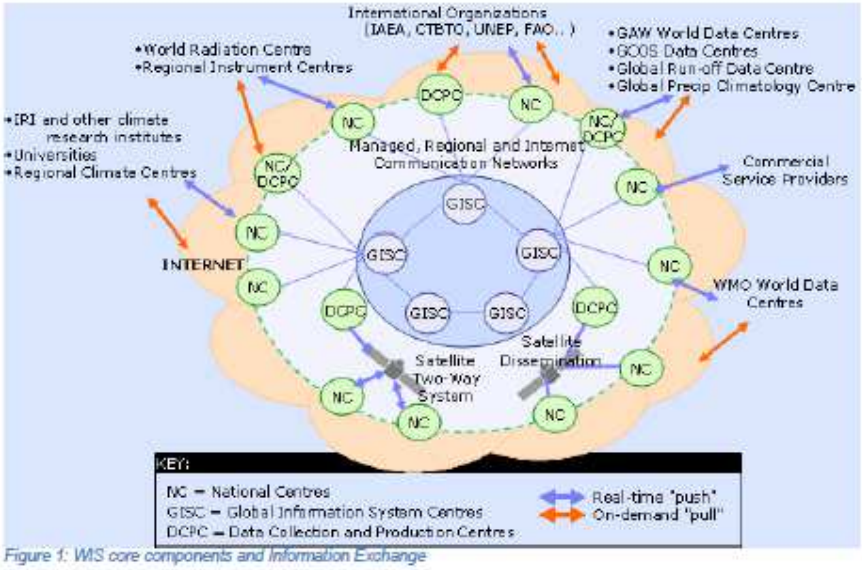


Figure 1: WIS core components and Information Exchange

4.4 WIS data networks

The WIS network structure consists of a WIS Core Network connecting all GISCs to each other. Each GISC has an Area Meteorological Data Communication Networks (AMDCN) connecting them to NCs and DCPCs in their area of responsibility. This is illustrated in Figure 2. An NC or DCPC may be in multiple AMDCNs. The AMDCNs incorporate GTS infrastructure and may involve single, partial or multiple regional meteorological telecommunication networks.

The data communication networks that can be used in WIS include:

- The Main Telecommunication Network (MTN) of the GTS [3] forms the WIS Core Network.
- GISCs are also connected by the Internet, which presently is being used for discovery metadata synchronization.
- The GTS (MTN and RMTN) provides the dedicated network component of the AMDCNs, especially for meeting real-time exchange requirements and the all hazards network. Note that the GTS includes extensive use of Internet through Virtual Private Networks (VPN) in many areas where no alternatives exist.
- Satellite distribution systems such as those described by the Integrated Global Data Dissemination Service (IGDDS) form an essential part of the GTS and therefore the WIS, especially for the support of remote areas where terrestrial communication systems do not effectively meet the need. This includes data collection systems for remote platforms as well as for distribution of data and products related to the WMO Space Programme.
- Terrestrial links or managed data network services.
- The Internet, either open or utilizing VPN, which will be used in the AMDCNs to increase bandwidth capacity to many centres as well as providing connectivity for non-GTS centres and for individual users accessing WIS.

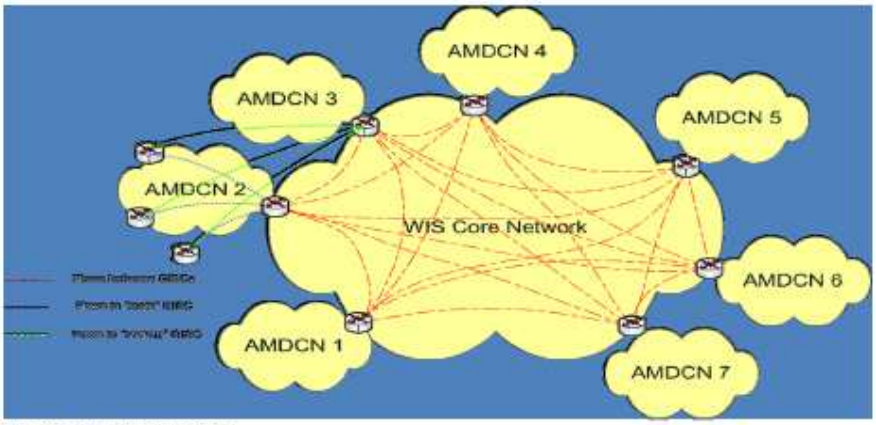


Figure 2: WIS network topology

4.5 Benefits of WIS

As an integrated part of WIS from the World Weather Watch Programme (WWW), the aim of the GTS is to ensure delivery of time-critical and operation-critical data, products and services for all

[3] A full description of the existing GTS structure and networks can be found in the Manual on the GTS (WMO-No. 386). http://library.wmo.int/opac/index.php?lvl=notice_display&id=47

WMO Programmes, including warnings to and from NMHSs. GTS realizes this through the "Routine collection and dissemination service for time-critical and operation-critical data and products", mentioned above.

The GTS will continue to develop and incorporate new technology, linking all WMO Members with a dedicated, secure network. This network will continue to be supported by advanced satellite distribution systems. In addition, the GTS will also be able to supplement the private networks and make better use of public communications such as the Internet, where appropriate.

The GTS data management framework will include the development of data representations, including fast and efficient coding practices that allow increasingly voluminous data streams to reach countries with less advanced or low capacity communication systems. New functionality of WIS for GTS users will include:

- Online discovery of which data and products are available on the GTS by interactively accessing a GISC portal;
- Download or re-runs of GTS data and products published during the past 24 hours. This is of interest for users that have missed data because of a failure of IT systems, equipment or networks;
- Updating of GTS routeing based on online subscription services rather than service messages requesting the GTS Point of Contacts to change the routeing. An NMHS may configure its own routeing information. Thus, a centre needs only deal with its associated GISC for changing subscription and publishing schedules;
- Configure upload of data to the GTS. Rather than requesting the GTS Point of Contact and WMO to change information about the data that is uploaded to the GTS, the NMHS may do the configuration.
- Ensure that the ownership and availability of the data provided is advertised by using the DAR metadata.

Existing centres within WMO Member States that comply with the required WIS functions and technical specifications will be designated as one of the three types of WIS centre. While Members can chose to apply for a type of centre matching their level of responsibilities and commitment, the expected mapping of WWW centres into WIS centres remains to be:

WWW Centre	**WIS** Centre
NMC	NC
RSMC	DCPC
WMC	DCPC and/or GISC
RTH	DCPC
RTH on MTN	DCPC and/or GISC
Others	NC and/or DCPC

4.6 WMO information sources and regulations on WIS

Information on all aspects of WIS is available on the WMO website at: http://www.wmo.int/wis

The implementation of the WIS is coordinated through a Global Project and Implementation Plan available at: http://www.wmo.int/pages/prog/www/WIS/documents/WIS-ProjectPlan-v1-2-1.doc.

The technical regulations related to WIS are published in the **WMO Technical Regulations (WMO-No.49), Volume 1, General Meteorological Standards and Recommended Practices,**

Part I, Section 3, and in Annex VII, Manual on the WMO Information System (WMO-No.1060). Practical guidance on the implementation of the technical regulations is provided in the Guide to the WMO Information System (WMO-No. 1061).

5. WIS in Region V (South-West Pacific)

5.1 Current status of RA-V telecommunication[4]

The current GTS in RA-V is a hierarchical structure with three Regional Telecommunications Hubs (RTH); Melbourne, Wellington and Washington.

All other Members are connected to at least one RTH. The data is sent from RTH to RTH and then from the RTHs to the other nodes connected to it. The current communication links and bandwidth of some links between the centres are given in Fig. 3a below.

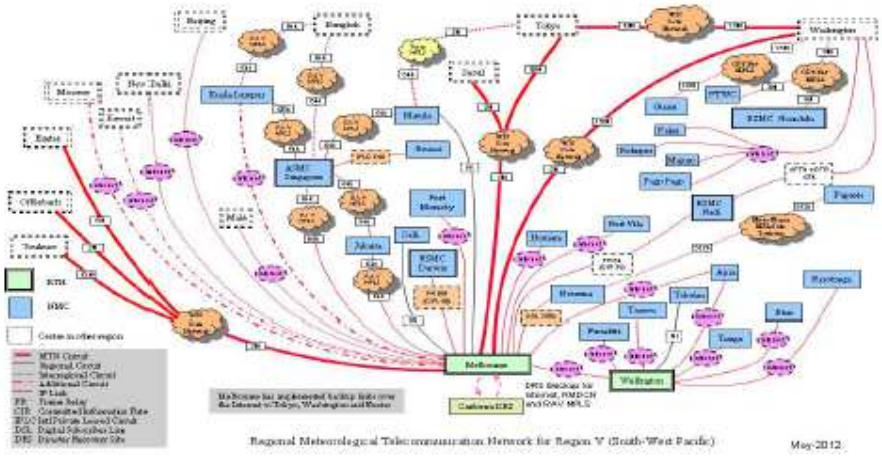


Figure 3a: Communication network in RA-V

In addition to MPLS based communication network shown in Fig.3a, many centres in RA-V also rely on satellite, digital HF radio as an important communication mechanism. Details of the implementation of telecommunication systems via satellite and radiobroadcasts are shown in Fig.3b

[4] The figures in this section (3a, 3b, 4 and 5) are in need of update and clarification. This will be done for a future version.

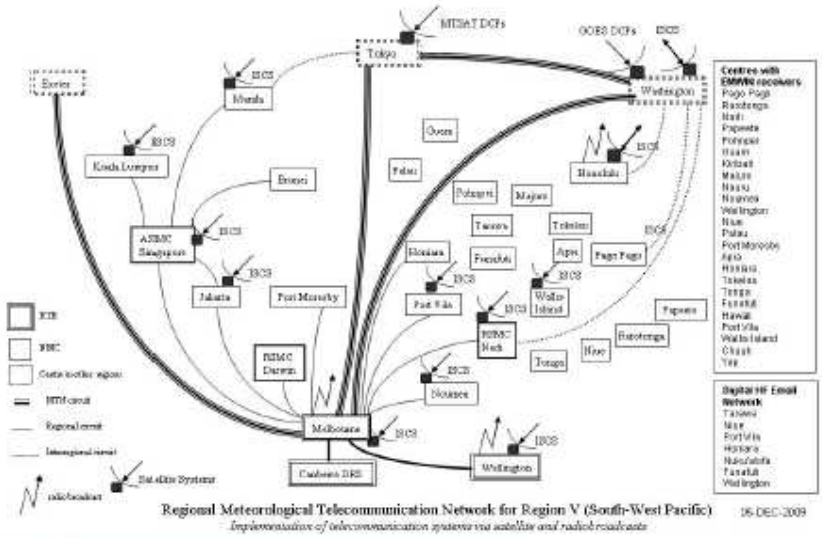


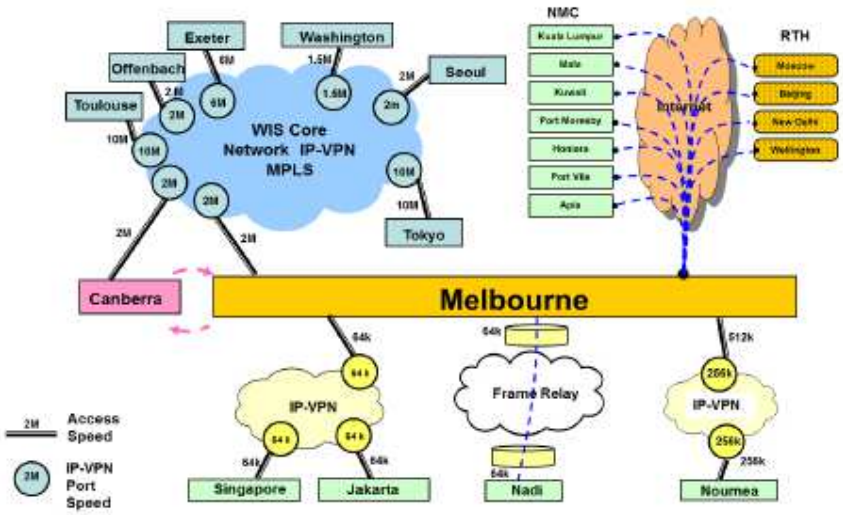
Figure 3b: Satellite and radiobroadcasts communication network in RA-V

GISC Melbourne has joined the Regional Meteorological Data Communication Network (RMDCN)[5] since September 2009, which provides an Internet Protocol (IP) network infrastructure and gateway for the meteorological community in RA-V.

Fig. 4 below shows the WIS Core Network and GISC Melbourne's AMDCN in RA-V, whereby

- Melbourne will be connected to all GISCs, presently, GISCs Tokyo, Exeter, Washington, Toulouse and Offenbach, via the WIS Core Network
- The new connection to GISC Offenbach completed in February 2013 and arrangement are being made with GISC Seoul to be connected as both centres became operational.
- IP-VPN with Singapore and Jakarta
- Frame relay with Nadi in Fiji
- Internet connections with a number of NMC and RTH centres in the region and outside the region.

[5] see http://www.ecmwf.int/services/computing/rmdcn/



GISC Melbourne - WISC Core Network and AMDCN

Figure 4: GISC Melbourne – WIS Core Network and AMDCN in RA-V

The Frame Relay connection between Melbourne and Noumea was replaced by a DSL link in 2011 as Frame Relay in Noumea was decommissioned on 31 May 2011. Unfortunately the DSL link could not be installed in time before the Frame Relay was decommissioned. In order to maintain the GTS dataflow to Noumea Melbourne and Toulouse established a re-routeing plan for all GTS traffic to Noumea via the Toulouse – Melbourne connection in the WIS Core Network. The Melbourne –Noumea DSL link became operational on 26 July 2011. The re-routeing plan proved to be a successful arrangement for Noumea and will serve as a backup link for Noumea.

Connections to GISC Offenbach and Seoul are organized for WIS operation including the planned DAR synchronization and harvesting operations between GISC centres. Bilateral arrangements between Melbourne and Seoul also require Melbourne to provide GISC backup for Seoul in re-routing GTS traffic to Karachi and Tashkent via New Delhi and Moscow.

The RA-V AMDCN link between Singapore and Manila was not in operation until 2 December 2010 after the Frame Relay migration to IP-VPN in the region (Fig. 5). During the period of outage re-routeing of all GTS traffic to Manila was done via Singapore and Tokyo.

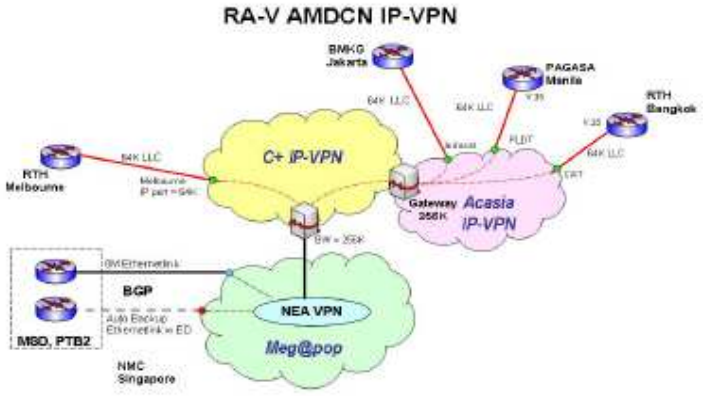


Figure 5: RA-V AMDCN IP-VPN

5.2 Status of WIS Centres in Region V (South-West Pacific)

The procedures for the designation of the three types of WIS centres are provided in the *Manual on WIS (WMO No. 1060), Part II*. After successful completion of the designation procedure, the centre is included in Appendix B to the Manual, Approved WMO Information System Centres.

Note: Information on the current status of the designation of centres by Members is available on: http://www.wmo.int/pages/prog/www/WIS/centres/index_en.php .

a. GISCs in RA-V

GISC Melbourne is the only GISC located in RA-V having been formally designated by EC64 in June 2012. It became operational on 16 April 2013.

b. DCPCs in RA-V

The table below provides information on the DCPCs in RA-V with their planned functions and designation status (as of February 2014).

Member / Org	Function	Principal GISC	Const. Body	Endorsement CBS	Congress/EC
Australia	Tsunami Warning Service (TWS)	Melbourne	JCOMM	Endorsed by CBS	2011-06-01
Australia	RTH	Melbourne	CBS	Endorsed by CBS	2011-06-01
Australia	RSMC-Geographical (Darwin)	Melbourne	CBS	Endorsed by CBS	2011-06-01
Australia	NCC	Melbourne	CCl	Endorsed by CBS	2011-06-01
Australia	IPS	Melbourne	CBS	Endorsed by CBS	2011-06-01
Fiji	RSMC-Activity-TC	Melbourne	CBS	Not submitted to ET-GDDP	

New Zealand	RTH	Melbourne	CBS	Not submitted to ET-GDDP	
New Zealand	RSMC-Geographical	Melbourne	CBS	Not submitted to ET-GDDP	
New Zealand	VAAC	Melbourne	CAeM	Not submitted to ET-GDDP	
United States of America	RSMC-Activity-TC (Honolulu)	Washington	CBS	Not submitted to ET-GDDP	

c. NCs in RA-V

In accordance with the Manual on WIS (WMO No. 1060), each WMO Member shall notify WMO of the name and location of its centre(s) that are to be designated as NC(s). It is therefore expected that each Member will have at least one NC in WIS (and for most of the Members, it is likely that one NC would be sufficient),

In February 2012, WMO circulated a letter to all Members inquiring information from the Permanent Representatives regarding: 1) nomination of a principle GIS which will be associated with the WIS centre(s) of the Member; and, 2) nomination of a focal point for WIS/GTS related matters).

The table below presents the current status[6] of the designation of NCs in RA-V with their associated GISC and Focal Points.

Member / Org	Function	Principal GISC	Focal Point (FP)	FP confirmed to WMO
Australia	NMC	Melbourne	Weiqing QU w.qu@bom.gov.au	Yes
Australia	NHS	Melbourne	Weiqing QU w.qu@bom.gov.au	
Brunei Darussalam	NMC	Melbourne		
Cook Islands	NMC	Melbourne	Roro TAIA rorotaia@oyster.net.ck	No
Fiji	NMC	Melbourne	Leonard BALE Leonard.Bale@met.gov.fj	No
France	WSO (Wallis and Futuna)	Toulouse		
French Polynesia	NMC	Melbourne	Xavier MARESCOT xavier.marescot@meteo.fr	
Indonesia	NMC	Melbourne	Mochmmad RIYADI mochmmad.riyadi@bmkg.go.id Endang PUDJIASTUTI endang.pudjiastuti@bmkg.go.id Iky Asih MARIANI iky.asih@bmkg.go.id I. PUTA PUDJA puta.pudja@bmkg.go.id	Yes for I. PUTA PUDJA
Kiribati	NMC (Phoenix Islands)	Melbourne	Iokenti BENIAMINA beniamina70490@gmail.com	No
Malaysia	NMC	Melbourne	Zabani MD ZUKI zabani@met.gov.my	Yes
Micronesia, Federated States of	N/A	Washington	Sosten SOS sosten.sos@noaa.gov	No
New Caledonia	NMC	Melbourne	Jacqies ANQUETIL	No

[6] The current status is based WMO WIS Centres Database. Focal Point is based on answer to the questionnaire by the participant of RA-V Workshop on WIS/TDCF, Melbourne, Australia, 29 April – 3 May 2013.

Member / Org	Function	Principal GISC	Focal Point (FP)	FP confirmed to WMO
New Zealand	NMC (Tokelau)	Melbourne	Filipo PEREZ filipo.perez.fp@gmail.com	No
New Zealand	NMC	Melbourne	Wim VAN DIJK wim.vandijk@metservice.com	Yes
Niue	NMC	Melbourne	Sionetasi PULEHETOA Sionetasi.Pulehetoa@mail.gov.nu	Yes
Papua New Guinea	NMC	Melbourne	Jimmy GOMOGA jgomoga@gmail.com	No
Philippines	NMC	Tokyo	Vicente Jr PALCON vppalconir@pagasa.dost.gov.ph	No
Samoa	NMC	Melbourne	Mulipola Ausetalia TITIMAEA ausetalia.titimaea@mnre.gov.ws	No
Singapore	NMC	Melbourne	Huat Aik CHOO Choo_huat_aik@nea.gov.sg	Yes
Solomon Islands	NMC	Melbourne	Allan WALE'ELE a.wale@met.gov.sb	No
Timor-Leste	NMC	Melbourne		
Tonga	NMC	Melbourne	Ofa FA'ANUNU ofaf@met.gov.to	No
Tuvalu	NMC	Melbourne	Tinapa FALETIUTE faletiute@yahoo.com	No
United Kingdom of Great Britain and Northern Ireland	WSO (Pitcairn Islands)	Exeter		
United States of America	WSO (Line Islands, Guam)	Washington		
Vanuatu	NMC	Melbourne	Patricia MAWA patou@meteo.gov.vu	Yes

Note: *In view of the important role the national WIS focal points plays in the coordination of the WIS implementation, the Members who have not yet responded to the WMO circular letter are strongly encouraged to do soon as soon as possible. Members should also keep the WMO Secretariat informed of any changes of the status and operation of their centres and/or changes of their focal points information.*

6. WIS planning and implementation by RA-V Members

In planning the WIS implementation at national level, Members should strive to comply with the relevant WMO technical regulations, that include procedures, specifications and functional requirements, provided in the *WMO Technical Regulations (WMO-No. 49), Volume I, Part 1, Section 3*, and the *Manual on WIS, (WMO-No. 1060)*. The *Guide to WIS (WMO-No. 1061)* complements the technical regulations with additional description and explanation of the WIS, which would assist Members in their implementation actions.

6.1 Pre-requisites for participate WIS operation by an NMHS as NC

For a NMHS, there are several requirements to be met by a current GTS centre and thus become a compliant NC. They are mostly concerned with administrative issues and less with technical matters.

When a centre plans to use WIS, the PR of the country should nominate a "WIS Focal Point" and a "Principal GISC".

a. WIS Focal point

The WIS Focal point should be a member of staff who is familiar with the service, in particular the current GTS support. The person will receive all WIS related information with regard to the country on one hand, but is expected on the other hand to inform WMO and its relevant bodies about any progress or problems encountered when using WIS. He/she will attend training courses organized by WMO or WIS centres and serve as the national distributor of WIS knowledge, in particular the concept of metadata. It is envisaged that the WIS Focal point will provide the necessary monitoring information.

Since the structure of WIS assumes that an NC is connected to a GISC for its WIS functions and thus participates in the AMDCN organized by that GISC, it is necessary to set up the required administrative links with the GISC. In principle, an NC may belong to the users of any GISC, unless the network connectivity only allows one choice. In any case, an agreement should be reached between the NC and the GISC about their relationship, including identifying their "Principal GISC" for the purposes of managing discovery metadata, of which the WMO should be notified together with the nomination of the WIS Focal point (see Appendix).

For users who want to access GISC system for services and request an account on the GISC system, the GISC is required to seek permission from the WIS Focal Point of the country where the users are from.

b. Principal GISC

The principal GISC will ensure within its AMDCN that all connected centres will receive all the data meant for them, be it globally distributed, additional or addressed data. The principal GISC will also collect the data sent by NCs and distribute them in accordance with GTS/WIS regulations. It will maintain the global metadata catalogue and provide means for its AMDCN centres to create/update those parts of the discovery metadata catalogue describing their own data and products, possibly via Internet access.

The principal GISC is to be contacted first by any of its connected centres about any issue related to WIS. It will organize regular meetings with the WIS Focal Points of the centres belonging to its AMDCN and provide training material and courses as required. It will support the metadata activities in its area of responsibility in a suitable manner and provide data for the regional WIS monitoring.

Member countries and specifically their national WIS Focal Points are urged to maintain active collaboration with their principal GISC. For many RA-V countries that is GISC-Melbourne for which the contact details are provided in Appendix VI.

Besides the principal, a back-up GISC is required for operational continuity in case the partial or total failure of the principal GISC. To guarantee at least the dissemination and collection of the globally distributed GTS data, the principal GISC need to consider a communication connection being established between NCs and the backup GISC, in collaboration with the NC and the backup GISC. Agreement needs to be reached on the network specific details, the conditions when it should be used and the actual services provided by it. Regular tests should be carried out to ensure the availability of the back-up when suddenly required. Details of further back-up arrangements to be provided still need further work by the relevant CBS WIS expert teams.

c. **Connectivity**

As mentioned in 5.1, the network connections of RA-V Members vary from high-speed RMDCN links, IP-VPN, Frame Relay, to low bandwidth internet connections. RA-V members are connected to RTH Melbourne and RTH Wellington through one of those connections, which enable them to access the WIS services provided by GISC Melbourne.

d. **Bandwidth**

In contrast to the GTS where the dedicated network bandwidth between adjacent centres was limited and thus the traffic between any two centres had to be prioritized in advance, the WIS approach allows for the use of the Internet and allows for the combined the bandwidth of the Internet, satellite broadcast systems and dedicated network to be sufficient to support the intended data exchange between the GISC and the NC. For the purposes of transmit WMO essential and additional data, a dedicated bandwidth of 64 kbps should ideally be the minimum bandwidth. Unfortunately, this minimum bandwidth cannot be guaranteed in some countries in RA-V. It is, however, important to improve the connectivity in the process of WIS implementation in RA-V. The reliable connectivity with reasonable minimum bandwidth is the key to access WIS services, including data discovery, as well as data delivery.

e. **Discovery Metadata**

Whereas the GTS data is defined by its header which is recorded in the relevant volumes, held by WMO, the data in WIS is described by a discovery metadata record in accordance to the WMO Metadata Core Profile and is stored in a metadata catalogue for each GISC and shared amongst all GISCs at regular intervals. It is the responsibility of the data owner to generate the corresponding discovery metadata record and to maintain it. However, in order to facilitate the initial deployment of WIS, Météo France generated metadata records for all data currently exchanged via the GTS. In the longer term though, these initial records have to be taken over by the relevant data owners and updated if required. In addition, if any new data is being considered for exchange, a corresponding discovery metadata record has to be generated and sent to the principal GISC in advance of the data.

Each NC, therefore, requires personnel with metadata knowledge and responsibility. To train the staff of NCs in discovery metadata handling, their principal GISC will offer regular training courses in addition to WMO sponsored training events like the WMO WIS Centre Jump-Start Offer[7]. Each NC should make sure that staff are knowledgeable about the WMO Metadata Core Profile and are able to update its metadata records.

[7] WIS Jump Start - http://www.wmo.int/pages/prog/www/WIS/documents/JumpStartFlyer.doc

f. **Access to metadata editor**

The editor for metadata records consists of a software tool which can be used locally by an NC or remotely at a GISC which makes this service available to NCs. New or modified records have to be made available to the principal GISC for feeding them into the WIS.

g. **Demonstration of WIS Compliance**

A National Centre will need to demonstrate its compliance with WIS standards as laid out in the Manual on WIS. This is achieved by the centre working with the principal GISC to successfully complete the three test cases in Appendix IV and advising the secretariat that the GISC has endorsed the centre as having demonstrated its compliance with relevant WIS standards.

6.2 Pre-requisites for participation of WIS operation by other centres

There may be other WIS centres besides the NC of an NMHS within a country. For example, the NMHS might also operate one or more DCPCs for specialized data or there may be multiple DCPCs run by different organizations like hydrology and oceanographic centres. It is also possible, though unlikely, that a centre other than the NMHS could operate an NC.

a. **DCPC**

As stated earlier, a DCPC is the WIS categorization of a programme centre that provides programme-specific data, e.g. An RTH is a centre supporting the GTS, or a RSMC providing specialize products under the GDPFS. Therefore, it has to be sponsored by a WMO programme and connected to a GISC in the region with sufficient bandwidth. In addition, special software to support the WIS functions of the centre has to be implemented. Once this has been achieved, the relevant PR may submit a proposal to WMO for the DCPC to be accepted, nominating a staff member responsible and stating the commitment to operate the DCPC after its validation.

In accordance with the Manual on WIS, a number of certifications and tests by WMO and, in particular, the CBS expert team designated for this role, will subsequently be carried out. When all operational and administrative requirements have been met successfully, including the handling of metadata in accordance with WMO Metadata Core Profile, CBS will propose to the EC that the DCPC becomes part of WIS.

b. **NC**

Any NC additional to that of the NMHS will have to adhere to the same procedures as stated in 6.1 Its WIS centre Focal point should work closely with the national WIS Focal point of the NMHS who will be the main WIS interface of the country.

7. Challenges associated with WIS implementation in RA-V

7.1 Insufficient bandwidth of communication links

A reliable communication link with sufficient bandwidth is a big challenge in RA-V for the WIS implementation. As shown in Fig. 5 above, there are many RA-V Members who rely on internet communication links with limited bandwidth for their data services. There are also risks of service interruptions associated with possible failures of the Internet network, in particular in the Pacific Island Countries in RA-V. Efforts have to be made in RA-V to improve the connectivity. Although it is primarily the responsibility of each Member country to implement adequate communications, the Members are working together through the RA-V WG-INFR in an effort to find optimum solutions.

7.2 General WIS acceptance

The benefits of WIS rely to a large extent on the global acceptance of WIS as the standard communication, discovery and access platform for WMO and associated institutions. Although WIS has been declared operational in January 2013, many NMHC centres in RA-V are still in the process of learning and understanding WIS. It is, therefore, necessary to raise the awareness of WIS in the region. GISCs should help centres to gain in-depth knowledge of how WIS works and what the benefits are. Other WMO initiatives such as WIGOS and GFCS are encouraged to use WIS as their information system, which will ensure the full benefits of WIS to all WMO Programmes and activities.

7.3 Lack of staff resources for operational WIS centre

Depending on the type of WIS centre being considered, there may be a concern of staff resources. For example, to operate a DCPC, staffs are required, who understands the software/system such as DAR to support the metadata. For an NC, the requirements can usually be met by the available resources for the on-going GTS support. Generally, staffs need to be trained to run WIS system and handle WIS related requests.

7.4 Discovery Metadata knowledge

Initially, there may be a lack of relevant metadata knowledge amongst the staff of the prospective WIS centre. It is therefore important to train staff on the WMO Metadata Core Profile and metadata in general. In addition, the WMO would try to arrange for training courses and support the attendance of relevant staff from developing countries. The necessary training material should be widely circulated. Furthermore, centres may take the WIS Jump-Start offered by the WMO secretariat or GISCs.

8. RA-V WIS Implementation Plan – Execution and Timeline

8.1 Approval

This Implementation Plan will be reviewed by WG-INFR and then presented to the President of RA-V for approval.

8.2 Regional coordination and monitoring

The regional WIS implementation will be coordinated by RA-V WG-INFR, with the support from GISC Melbourne. An important aspect of the regional approach is the monitoring of the implementation actions that would allow quick identification and response to the problems and deficiencies. Without monitoring, there is a high risk that the implementation of WIS in some parts of RA-V would be delayed. The monitoring procedures will be defined to include regular information flow between RA-V WIS Focal Points, and WG-INFR/TT-WIS. GISCs and DCPCs will play an important role in the monitoring as described in 8.6 below.

8.3 National implementation plans

Members are expected to develop their national WIS Implementation Plans by Nov 2014. The national WIS Focal point should communicate the national plans to the RA-V WG-INFR the target dates for the planned operation of WIS centres (NC, DCPC). The national plans should be coordinated with the principal GISC and should be in agreement with the RA-V WIS Implementation Timeline.

8.4 Capacity building – training and support

WG-INFR (through its Task Team on WIS and Task Team on migration to Table Driven Code Forms) is tackling a funded project to assist the implementation of WIS in RA-V. The RA-V WIS/TDCF workshop was held from 29 April to 3 May 2013, and organized by GISC Melbourne. Training on WIS related topics, such as Metadata etc, was provided during the workshop. After the workshop, the members will need to continue to build the capacity on WIS and its operation. GISCs should provide help and support in this regard. Countries will be assisted by their principal GISC to develop their national implementation plans, with in-country visits to Pacific countries by a WIS expert.

8.5 Goals and timeline

The main goal of the WIS implementation in RA-V is that the majority of RA-V Members should be WIS users by November 2015, which means that most NMHSs are:

a) Certified as a NC or DCPC, according to the WMO WIS center certification procedure outlined in the Manual on WIS. The principal GISC of those NMHSs shall help in this process by providing technical support and conducting test for all WIS related operations together with the NCs or DCPCs.

b) Able to participate major WIS operations, i.e. a NC or DCPC should be able to obtain data and products from WIS system of its principal GISC, and to provide its own observation data and other products, along with the associated metadata, to its principal GISC.

The WIS implementation efforts so far and future timeline is as follow:

a) April 2013: RA-V WG-INFR meeting – set the direction for WIS (and WIGOS) implementation.

b) May 2013: RA-V WIS/TDCF Workshop – provided the training on WIS/TCDF to majority of RA-V members, with the support from AusAID and WMO.

c) August 2013: RA-V WIS Implementation Plan being developed and agreed by the members through RA-V WG-INFR and TT-WIS.

d) November 2013 – November 2014: GISC Melbourne, as the Principal GISC form majority of RA-V members, helps the following countries to establish their national WIS implementation plan: Cook Islands, Papua New Guinea, Samoa, Fiji, Solomon Islands, Kiribati, Tokelau, Tonga, Nauru, Tuvalu, Niue, Vanuatu. This effort is supported by a BoM project funded by AusAID and includes in-country visits by a WIS expert. GISC Melbourne will also provide support for other RA-V members in their efforts of making their national WIS implementation plan. During this period, the members should starts to review/update/generate their metadata hosted in DAR of their Principal GISC.

e) November 2014 – November 2015: Act on the National WIS Implementation plan by each member, with the help and support from its Principal GISC, to archive the goal outline at the beginning of this paragraph.

8.6 Progress and Performance Monitoring

RA-V WG-INFR in conjunction with GISC Melbourne will play an active role in monitoring the progress of the WIS implementation in the region. A half-yearly (quarterly?) report will be issued to all members to report the overall progress of the implementation. The members should also report their experience with metadata and problems encountered, as well as other implementation related issues, so that this information can be shared among the members through the half-yearly report.

Further improvement of the communications connectivity in RA-V is an ongoing task, which is crucial for the success of WIS implementation in the region. It is important to cooperate with other Task Teams within WG-INFR to work on this task.

APPENDIX I

Action Plan for implementing a NC in RA-V under WIS

1. Make (national) decision to join WIS as a NC.
2. Identify the Principal GISC.
3. Nominate the WIS Focal Point for the NC. The person should preferably be knowledgeable on current GTS operation and the concept of WIS.
4. Review the status of the communication network, in particular the bandwidth to the current RTH and the bandwidth of the Internet connection.
5. Review the current GTS operation in terms of data exchange and ensure that the communication network is sufficient to send and receive data a reliable and timely fashion under WIS. If this is not the case, the improvement of the communication network would be a priority. Solutions, such as increasing the bandwidth existing network or adopting additional communication means (e.g. satellite communication etc.) need to be implemented.
6. Communicate with the chosen Principal GISC for support in the process of NC certification. Test cases listed in Appendix IV need to be carried out in cooperation with the GISC and approved by GISC.
7. Set up a communication link to the principal GISC and create user accounts at the GISC for using the GISC systems.
8. Decide whether the metadata generation/update should be supported locally or remotely by the GISC. In view of this decision, set up the necessary software environment: either by installing the metadata editor on a local server or by setting-up a connection to the GISC to use the metadata editing facility on GISC system.
9. Inform WMO by letter from the PR on a) the decision to become an NC and the endorsement from the Principal GISC after the success in performing the test cases; b) the choice of the principal GISC and the nomination of the WIS Focal point, if haven't done so yet.
10. Train a staff member and, if possible, a back-up in the WMO metadata Core Profile by sending them to training courses organized by WMO or the GISC. It is also possible to ask for on-site support/training through the WMO WIS Jumpstart Offer.
11. Take over responsibility for the metadata records describing the data submitted by the NMHS and modify/update them, if necessary.
12. Start using the WIS functionality for sending and receiving data with their associated metadata.
13. Join the user group of the GISC by attending meetings and other organized events.
14. Support the monitoring of the regional WIS operation by responding to queries and/or questionnaires from the Principal GISC, which collects information, including availability of service, network traffic status, errors and other comments etc.

APPENDIX II

Action Plan for implementing a DCPC in RA-V under WIS

1. Make (national) decision to join WIS as a DCPC. Inform WMO, in particular CBS, by letter from the Director of the Organization about the wish to become a DCPC.
2. Identify the Principal GISC.
3. Nominate the WIS Focal Point for the DCPC. The person should preferably be knowledgeable on current GTS operation and the concept of WIS.
4. Review the status of the communication network, in particular the bandwidth to the current RTH and the bandwidth of the Internet connection.
5. Review the current GTS operation in terms of data exchange and ensure that the communication network is sufficient to send and receive data a reliable and timely fashion under WIS. If this is not the case, make sure that an upgrade of the communication network is planned and implemented prior to the operation as a DCPC.
6. Select and install system(s) that can provide required services by a DCPC, as described in the Manual on WIS, in particular the metadata management, which is new under WIS.
7. Communicate with the chosen Principal GISC for support in the process of DCPC certification. Contact CBS ET-WISC to organize demonstration of DCPC capability, in order to be endorsed by CBS and designated by WMO Cg as a DCPC.
8. In accordance with the Manual on WIS, collaborate with the relevant CBS ET's to pass all the necessary tests for a DCPC, which are outlined in the WIS Demonstration Process "Procedures and Guidelines" (http://www-db.wmo.int/WIS/centres/guidance.doc).
9. Once the tests have been passed successfully and the centre has been endorsed by WMO Congress / EC, set up operations as a DCPC
10. Join the user group of the GISC by attending meetings and other organised events.
11. Support the monitoring of the regional WIS operation by responding to queries and/or questionnaires from the Principal GISC, which collects information, including availability of service, network traffic status, errors and other comments etc

APPENDIX III

Sample letter by PR of country to WMO for Establishment of NC, nomination of the WIS Focal point and the Principal GISC

To: the Secretary-General

WMO

Subject: Proposal for designation of WIS National Centre.

Dear Secretary-General,

In accordance with the *Manual on the WMO Information System (WMO-No. 1060)*, para 2.4.2, and as part of the national plan for the implementation of the WIS, I would like to request that the centre [*name, location*], which is part of the [*name of the NMHS*], be designated as a National Centre (NC) of the WMO Information System (WIS), in accordance with the established procedure. I would like to inform you that the principal Global Information System Centre (GISC) associated to NC [name] should be [GISC name].

For coordination of WIS-related issues, I hereby nominate Mr/Ms [*name, position, email address, phone*] as the national WIS Focal Point.

Please update the records accordingly.

I look forward to receiving your advice on the action taken on the above request.

Yours sincerely

Permanent Representative of [*WMO Member*]

	catalogue,	the DAR catalogue	
…	A authorized user/process attempts to upload an invalid metadata record	The user/process must be notified of the fact that the metadata record is invalid. The addition/update operation is aborted. The DAR catalogue is unchanged.	
…	A authorized user/process attempts to upload a record with a unique identifier that is already in the DAR catalogue	The DAR catalogue should not contain record with duplicate identifiers. Either: 1. The new metadata record replaces the old metadata record. The old metadata record should not be present in the catalogue. The new metadata record must be found when browsing/searching the catalogue 2. The user/process must be notified of the fact that the record is a duplicate. The addition/update operation is aborted. The DAR catalogue is unchanged. Note: it is essential to ensure an update is an edit and not an accidental duplication	
…	Access control No unauthorized addition 1	A non-authorized user/process should not be able to add a metadata record to the DAR catalogue	
…	Access control – No unauthorized addition 2	A user/process should not be able to add a metadata record to the DAR catalogue representing data from another WIS centre	
…	Access control No unauthorized modification 1	A non-authorized user/process should not be able to modify a metadata record from the DAR catalogue	
…	Access control No unauthorized modification 2	A user/process should not be able to modify a metadata record from the DAR catalogue that belongs to another WIS centre	
…	Access control No unauthorized deletion 1	A non-authorized user/process should not be able to delete a metadata record to the DAR catalogue	
…	Access control No unauthorized deletion 2	A user/process should not be able to delete a metadata record from the DAR catalogue that belongs to another WIS centre	

Centre		**Organization**		**Country**	
Test Date					

Test Case Name: NC Demonstration Test Case 2	
Uploading and downloading of data between WIS centres	
Test Case ID	NC-TC2
Component	
Purpose of test	

Validate the upload and download of data and products and association with metadata					
Requirements Covered					
• Tech specs 2 (Uploading of data and products) • Tech specs 10 (Downloading file via dedicated network) • Tech specs 11 (Downloading file via non-dedicated network) • Tech specs 12 (Downloading file via other methods)					
Precondition					
1. Network connection (dedicated and/or public connection) between the NC and GISC (includes via RTH where relevant 2. Have file upload and download facilities (FTP, mail, HTTP, …) 3. Have data available for upload or download 4. Have DAR facilities available at GISC.					
Test Steps					
	Description	**Expected Results**		**Actual Results**	
1	a.upload a file which is associated with a metadata record in the DAR catalogue of the GISC to a GISC centre b. use DAR facilities to search the metadata then retrieve the file	a. The uploaded file has been delivered to the GISC and match with the corresponding metadata b. The file can be downloaded			
Center		**Organization**		**Country**	
Test Date					

Test Case Name: NC Demonstration Test Case 3			
Maintenance of users, roles, authorization and authentication			
Test Case ID	NC-TC3		
Component	Management of users and access		
Purpose of test			
Create and exercise a variety of user types. Note: A centre may GISC user control interface			
Relevant Technical Specifications			
• Tech specs 4 (Maintenance of User Identification and Role Information) • Tech specs 6 (Authentication of a User) • Tech specs 7 (Authorization of a User Role) • Tech specs 13 (Maintenance of Dissemination Metadata)			
Precondition			
1. The Centre has authority to provide access to users (ie PR approval) 2. A process is in place between the NC and GISC for the Centre to authorize its users to use the GISC with appropriate access levels. 3. The user interface is via the internet (i.e. web page)			
Test Steps			
	Description	**Expected Results**	**Actual Results**
1	Provide access for an external user to search metadata	Temporary user can search metadata, but not access data from the GISC or cache, or subscribe to data.	
	a) User goes to search web page b) User makes metadata search c) Tries to access data	a) User has access to search page b) User finds metadata c) User tries to access data and is referred to authorisation page at data source. Cannot access data without validating in an authorized user role	
2	Create accounts with access to WIS metadata and data for a WMO centre authorized user	Two users are created. One with access to metadata only, the other with the ability to access the Centre subscription service or ad hoc request from the cache	
	a) User goes to registered user web page b) User is required to login or create account c) User registers account and selects role of valid WMO member with authority to access WIS data (eg is from WMO NC) d) User enters login details e) User makes metadata search f) Tries to access WMO globally available	a) User has access to login page b) New user, so has to create an account c) User account is validated as a WMO NC member and account is created. The user receives a user login (eg code via email or encrypted symbol) d) User is logged in. As user us validated as WMO NC member, he is allocated access to search and access to download data from cache and to subscription services	

	data from the centre g) User tries to access additional data at centre that he is not authorized to access h) Tries to access data or product at another site i) User subscribes to data for future delivery from centre j) User returns on another session and reuses login to search or subscribe k) User edits subscription details l) User cancels a subscription m) User logs out or leaves centre's site and tries to return to a bookmarked page at a later date and access data	e) User finds metadata f) User successfully accesses data from centre g) User receives advice that he is not authorized to access this data and referred to access page where he can request change in user role or re-login as another user h) User is referred to authorisation page at other site. i) User receives scheduled data via agreed method at agreed time j) User maintains successful access with same access rights k) Users subscription details are updated and reflected in subsequent deliveries l) Users subscription details are updated and receives no further deliveries m) Attempting to use a bookmarked page from earlier session to access data, directs the user to the registered user login page.	
4	User checks status of account and subscriptions	User can view his account and subscription details, including historic and future transactions, and the status of current transactions	
...			

Center		**Organization**		**Country**	
Test Date					

APPENDIX V

List of acronyms

AMDCN	Area Meteorological Data Communication Network
CBS	Commission for Basic Systems
Cg	Congress
DAR	Data Access and Recovery
DCPC	Data Collection or Production Centre
ECMWF	European Centre for Medium-range Weather Forecasts
ET-WISC	CBS Expert Team on WIS Centres (responsible for GISC/DCPC demonstration process)
GFCS	Global Framework for Climate Services
GISC	Global Information System Centre
GTS	World Weather Watch Global Telecommunication System
IGDDS	Integrated Global Data Dissemination Service
IMTN	Improved Main Telecommunication Network
MPLS	Multi-protocol Label Switching
MTN	Main Telecommunication Network
NC	National Centre
NMHS	National Meteorological and Hydrological Service
PR	Permanent Representative
RA	Regional Association
RMDCN	Regional Meteorological Data Communication Network
RMTN	Regional Meteorological Telecommunications Network
RTH	Regional Telecommunication Hub
TT/WIS	Task Team on WIS in RA-V WG-INFR
VPN	Virtual Private Network
WG-INFR	RA-V Working Group on Infrastructure
WIGOS	WMO Integrated Global Observing System
WIS	WMO Information System
WMO	World Meteorological Organization
WWW	World Weather Watch

Appendix VI. Contact points for this plan

The following contact details are referred to within the text of the plan. These are recorded in this Appendix so that they can be updated without changing the text of the plan itself.

GISC Melbourne

Dr Weiqing Qu, WIS Focal Point

Bureau of Meteorology, 700 Collins Street, Melbourne. Australia.

w.qu@bom.gov.au or GISC-OP@bom.gov.au

+61 3 9669 4236 or +61 3 9669 4006 (This is NMOC 24/7 helpdesk)

Annex XII

W O R L D M E T E O R O L O G I C A L O R G A N I Z A T I O N
==========

DRA-AP/RA V-RECO

CONCEPT NOTE

Sixth Regional Conference on Management of National Meteorological and Hydrological Services (NMHSs) in Regional Association V (South-West Pacific)

(Jakarta, Indonesia, 30 April – 1 May 2014)

Theme: Better weather, climate and water services for sustainable development: challenges and future priorities

1. BACKGROUND

The Regional Conference on Management of National Meteorological and Hydrological Services (NMHSs) in Regional Association V (South-West Pacific) (RA V) (RA V RECO) is organized once during each WMO financial period. RA V RECO brings together Directors and/or senior officials of the National Meteorological and Hydrological Services (NMHSs) in RA V in a regional forum, with an ultimate aim to discuss emerging issues and challenges, and identify priorities and means for improvement of management and operations of NMHSs.

The Sixth Regional Conference on Management of National Meteorological and Hydrological Services (NMHSs) in RA V (RA V RECO-6) will be held in Jakarta, Indonesia, from 30 April to 1 May 2014. While focusing on on-going and emerging issues and challenges facing NMHSs in Region V especially those in the developing countries, Small Island Developing States (SIDS), and Least Developed Countries (LDCs), RA V RECO-6 will place more emphasis on future priorities to addressing them.

The purpose of the RA V RECO-6 is to help NMHSs identify and discuss issues and challenges Members are facing and identify future priorities to improve weather and climate services for sustainable development. Outcomes of the Conference will be reported to the Sixteenth session of RA V (RA V-16) to be held in Jakarta, Indonesia, from 2 to 8 May 2014.

2. SPECIFIC OBJECTIVES

The specific objectives of the RA V RECO-6 are:

(a) To identify issues and challenges, and future priorities in Region V during the next intersessional period for contributions to discussion during RA V-16 and to WMO SOP 2016-2019; and

(b) To identify contributions from WMO and RA V to, and expected key outcomes from, the Third International Conference on SIDS which is scheduled to be held in Apia, Samoa from 1 to 5 September 2014.

In order to achieve the above specific objectives, the provisional annotated programme is organized in the following areas:

(a) Session 1: RA V Future Priorities;

(b) Session 2: Institutional Challenges;

(c) Session 3: RA V Implementation of WMO Priorities and Response to Users' Requirements;

(d) Session 4: Partnership and Regional Cooperation;

(e) Session 5: Third International Conference on Small Island Developing States (SIDS);

(f) Session 6: Regional Challenges and Priorities; and

(g) Session 7: Recommendations

3. EXPECTED OUTCOMES

Expected outcomes of RA V RECO-6 are contributions to better weather, climate and water services for sustainable development in the Region and to the sustainable development of SIDS through identifying current challenges and future priorities.

4. EXPECTED PARTICIPANTS

Participants for RA V RECO-6 include Directors and/or senior officials from NMHSs or equivalent national institutions in Region V, WMO Secretariat staff, Leads and Chairperson of RA V Working Groups and the president and the vice president of RA V. The Working Groups' Leads/Chairperson, the president and the vice president of RA V are expected to facilitate the sessions of RA V RECO-6.

W O R L D M E T E O R O L O G I C A L O R G A N I Z A T I O N
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DRA-AP/RA V-RECO

PROVISIONAL ANNOTATED PROGRAMME

Sixth Regional Conference on Management of National Meteorological and Hydrological Services (NMHSs) in Regional Association V (South-West Pacific)

(Jakarta, Indonesia, 30 April – 1 May 2014)

Theme: Better weather, climate and water services for sustainable development: challenges and future priorities

The purpose of the Sixth Regional Conference on Management of National Meteorological and Hydrological Services (NMHSs) in RA V (RA V RECO-6) is to help NMHSs identify and discuss issues and challenges Members are facing and identify future priorities to improve weather and climate services for sustainable development. Outcomes of the Conference will be reported to the Sixteenth session of RA V (RA V-16) to be held in Jakarta, Indonesia, from 2 to 8 May 2014. The RA V RECO-6 will be held in Jakarta, Indonesia, from 30 April to 1 May 2014.

OPENING

The opening of the Conference will include delivery of opening statements and keynote presentation on the outcomes of the survey questionnaire

SESSION 1: RA V FUTURE PRIORITIES

The Leads and Chairperson of RA V Working Groups will present future priorities and deliverables in the Region. They will provide recommendations on regional priorities during the next intersessional period (2016-2019).

SESSION 2: INSTITUTIONAL CHALLENGES

A presentation will be made by the Secretariat on WMO organizational structure, arrangements, operations including its Technical Commissions, Regional Associations, and Executive Council, and linkages to NMHSs. It will be followed by presentations by the representatives from NMHSs with different capacities and economic sizes (advanced, developing, LDCs and SIDS). They will share challenges and issues that the NMHSs are facing at national, regional and global levels, and provide recommendations on priorities.

SESSION 3: RA V IMPLEMENTATION OF WMO PRIORITIES AND RESPONSE TO USER REQUIREMENTS

Progress of the implementation of WMO priority programmes and projects including aviation meteorological services, hydrological services, WMO Integrated Global Observing System/WMO Information System (WIGOS/WIS), climate services, Global Framework for Climate Services (GFCS), disaster risk reduction, and other priority issues in the Region will be presented by representatives of NMHSs, Leads and Chairperson of RA V Working Groups, and experts. Emerging issues and challenges in implementing WMO priorities will be discussed.

SESSION 4: PARTNERSHIP AND REGIONAL COOPERATION

Presentations will be made by representatives of key regional partners and regional projects, presenting recent development and progress related to the WMO programmes and projects in

Region V, particularly focusing on their contribution to the RA V Strategic Operating Plan (RA V SOP). Participants will discuss practical and proactive ways to improve the opportunities for the advancement of the NMSs and NHSs in the Region through partnership and regional cooperation.

SESSION 5: THIRD INTERNATIONAL CONFERENCE ON SMALL ISLAND DEVELOPING STATES

Presentations will be made on the current status of the preparation for the Third International Conference on SIDS, which is scheduled to be held in Apia, Samoa, from 1 to 5 September 2014. Participants will discuss contributions and involvement of WMO and RA V related to the Conference. The participants will also discuss and identify regional needs and expected outcomes from the Conference for the benefit of SIDS.

SESSION 6: REGIONAL CHALLENGES AND PRIORITIES

The *draft WMO SOP 2016-2019* will be presented by the Secretariat, and will be followed by discussion. Participants discuss and identify individual or subregional Members' needs and related priorities for 2016-2019 for contribution to WMO SOP 2016-2019. The outcomes of the discussion will be presented**.**

SESSION 7: RECOMMENDATIONS

Participants will discuss recommendations to RA V-16 regarding the challenges and future priorities, contribution to WMO SOP 2016-2019, and WMO and RA V contributions to, and expected key outcomes from the Third International Conference on SIDS.

CLOSURE OF THE CONFERENCE

RA V RECO-6 is expected to conclude discussions at 17:00 on 1 May 2014.

W O R L D M E T E O R O L O G I C A L O R G A N I Z A T I O N
==========

Sixth Regional Conference on Management of National Meteorological and Hydrological Services (NMHSs) in Regional Association V (South-West Pacific)

(Jakarta, Indonesia, 30 April - 1 May 2014)

Participation Nomination Form

1. Country: _____

2. Service or Organization: _____

3. Nominee:

   Surname (Dr/Mr/Ms): _____

   First name: _____

   Address: _____

   _____

   Telephone: _____

   Telefax: _____

   E-mail: _____

4. Proposed title of the presentation*, if applicable* _____

   under: ☐ Session 2 ☐ Session 3 ☐ Session 4 ☐ Session 5
   (See Concept Note.)

5. If financial assistance is required, please indicate whether for:

   Travel: ☐ Yes ☐ No Per diem: ☐ Yes ☐ No

6. Please indicate whether you are attending the sixteenth session of RA V: ☐ Yes ☐ No

Date: _____ Permanent Representative's signature: _____

W O R L D M E T E O R O L O G I C A L O R G A N I Z A T I O N
==========

Sixth Regional Conference on Management of National Meteorological and Hydrological Services (NMHSs) in Regional Association V (South-West Pacific)

(Jakarta, Indonesia, 30 April - 1 May 2014)

Information Note for Participants

Venue and duration of the Conference

The sixth Regional Conference will be held at the Auditorium of the Agency for Meteorology, Climatology and Geophysics (BMKG) in Jakarta from Wednesday, 30 April to Thursday, 1 May 2014. The Conference will start at 09h00 on 30 April 2014.

Registration of participants

Registration for the Conference will take place at the registration desk in the venue from 08h30 on 30 April 2014. Participants will receive identification badges at the time of registration.

Language

The Conference will be conducted in English.

Computer facilities

An Internet corner will be provided to delegates. In addition, the meeting room will be equipped with Wi-Fi access.

Entry requirements

All participants requiring a visa to enter Indonesia should apply for their visa directly from the Embassy or Consulate-General of the Republic of Indonesia in their country, or a designated country in cases where no Indonesian Embassy or Consulate is available in their own country. Diplomatic and service visas and entry permits, where required, shall be granted free of charge and as speedily as possible for their effective participation throughout the duration of the meeting, provided the application for the visa is made sufficiently in advance, i.e., more than one month before the beginning of the Conference.

Arrival and Transport Arrangements

Transport will be provided free of charge from the airport to the hotels and from the hotels to the venue of the session. You are kindly requested to notify the host country at early in advance of any changes in your flight schedule.

Banking

There are currency exchange offices in Soekarno Hatta airport as well as in all banks (opening hours are 9 a.m. to 3 p.m.). The local currency is the Indonesia Rupiah (US$ 1 ≈ 10,500-11,500 Rupiah). Credit cards are accepted at major hotels.

Accommodation

Participants are advised to make their own accommodation bookings well in advance, preferably before **25 March 2014**. Appendix A contains a list of recommended hotels in Jakarta, Indonesia where special rates have been negotiated with a certain number of them. When booking, you must provide details of your credit card for guarantee (type and No., name, expiry date). Bookings shall be made by faxing the Hotel Reservation Form contained in Appendix B to the local coordinator for RA V-16. A view of the area in the vicinity of the conference site is contained in Appendix C.

Further information

For any further information, please contact the WMO Secretariat or the Local Coordinator at the following address:

WMO Focal Point

Dr Chung Kyu Park
Director, Regional Office for Asia and the South-West Pacific
Email: cpark@wmo.int
Telephone: +41 22 730 8252 Fax: +41 22 730 8118

Local Coordinator

Mr Maman Sudarisman / Mrs Anni Arumsari
The Indonesia Agency for Meteorology, Climatology and Geophysics (BMKG)
Jl. Kemayoran I No 2, Jakarta Pusat, 10720
Republic of Indonesia

Telephone: (6221) 6546339, 4246321 ext. 2218, 2119
Fax: (6221) 6546339
E-mail: Maman_sudarisman@yahoo.com,
arumsari_anni@yahoo.com, anni.arumsari@bmkg.go.id

Please also refer to the RA V-16/INF.1 - Material Arrangements for the sixteenth session of RA V.

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Sixth Regional Conference on Management of National Meteorological and Hydrological Services (NMHSs) in Regional Association V (South-West Pacific)
(Jakarta, Indonesia, 30 April - 1 May 2014)

WORK PLAN

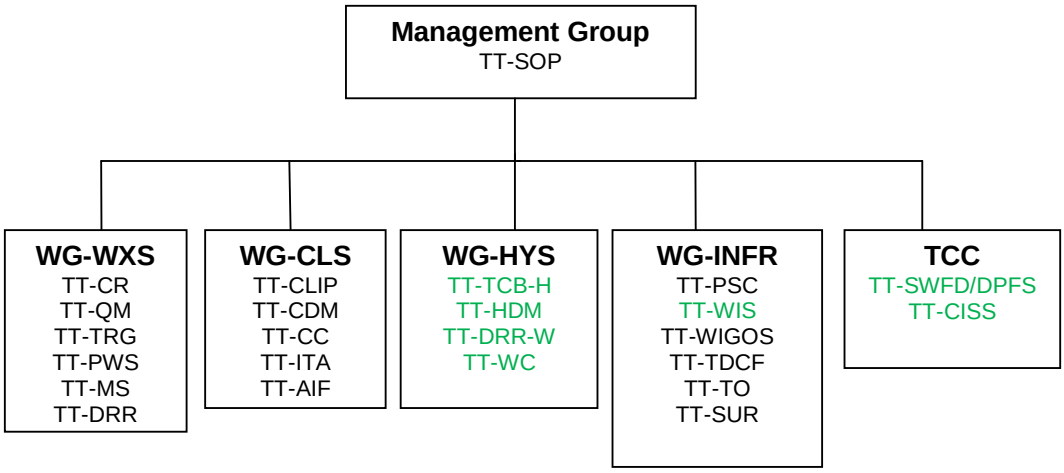
Wednesday, 30 April 2014			
08:30-09:00	**Registration (30')**	**14:00-15:30**	**Session 3: RA V Implementation of WMO Priorities and Response to Users Requirements (90')** *Presentations by PRs and experts on progress in aviation meteorological services, hydrological services, WIGOS/WIS, climate services, GFCS, DRR, and other priority issues in the Region.*
09:00-09:30	**Opening Ceremony (30')**		
09:30-10:00	**RA V Questionnaire – summary (15')** ***Group Photo & Refreshment (15')***	**15:30-16:00**	***Refreshment (30')***
10:00-11:30	**Session 1: RA V Future Priorities (90')** *WG Chairs - Reports (brief summary) on the regional priorities and recommendations for the next intersession period (2016-2019).*	**16:00-17:00**	**Session 4: Partnership and Regional Cooperation (60')** *Focused on recent development and progress of regional programmes and projects through partnership and cooperation:- SPREP/PMC/PMDP/FINPAC, SPC/SOPAC, ASMG & other regional cooperation programme and projects*
11:30-12:30	**Session 2: Institutional Challenges (60')** *Presentations by PRs or representatives of NMHSs from advanced, developing, LDCs and SIDS Members.*	**17:00-18:00**	Drafting Committee (60')
12:30-14:00	***Lunch Break (90')***		

Thursday, 01 May 2014			
09:00-10:00	**Session 5: Third International Conference on SIDS (60')** *Contribution and recommendations to the SIDS Conference.*	**14:00-15:00**	**Drafting Committee Discussion (60')**
10:00-10:30	***Refreshment (30')***	**15:00-17:00**	**Session 7: Summary of Recommendations (120')** *Challenges and future priorities of RA V for contribution to the WMO Strategic Plan 2016-2019, Recommendations on RA V OP 2016-2019, and Recommendations to Samoa Summit*
10:30-12:30	**Session 6: Regional Challenges and Priorities (120')** *Presentation: WMO SOP 2016-2019* *Groups' discussions on, identification and presentation of, Members' needs and priorities during the next intersession period (2014-2018).*		
12:30-14:00	***Lunch Break (90')***	**17:00**	***Closure of RECO-6***

Annex XIII

TENTH SESSION OF THE RA V MANAGEMENT GROUP
(Jakarta, Indonesia, 14 to 15 March 2014)

PROPOSED FUTURE WORKING STRUCTURE OF SUBSIDIARY BODIES OF REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC)



Management Group

TT-SOP: Task Team of Strategic Planning

WG-WXS: Working Group on Weather Services

TT-CR: Task Team on Cost Recovery
TT-QM: Task Team on Quality Management
TT-TRG: Task Team on Forecasters Competencies and Training
TT-PWS: Task Team on Public Weather Services
TT-MS: Task Team on Marine Services
TT-DRR: Task Team on Disaster Risk Reduction

WG-CLS: Working Group on Climate Services

TT-CLIPS: Task Team on Climate Information and Prediction Services including Regional Climate Centers (RCCs) and Regional Climate Outlook Forum (RCOF)
TT-CDM: Climate Data Management/Data Rescue
TT-CC: Task Team on Climate Change
TT-ITA: Task Team on Use of Improved Tools for Operational Agro-meteorology including Coping with Impacts of Natural Disasters on Agriculture
TT-AIF: Agro-meteorological Information

WG-HYS: Working Group on Hydrological Services

TT-TCB-H: Task Team on Training and Capacity Building in Hydrology
TT-HDM: Task Team of Hydrology Data Management
TT-DRR-W: Task Team on Disaster Risk Reduction – Water-related Disasters
TT-WC: Task Team on Water and Climate

WG-INFR: Working Group on Infrastructure

TT-PSC: Task Team of Pacific Satellite Communication
TT-WIS: Task Team on Regional Implementation and Operation of WIS
TT-WIGOS: Task Team on WIGIOS Interpretation and Opportunities
TT-TDCF: Task Team on Table Driven Code Form
TT-TO: Task Team on Traceability of Observations
TT-SUR: Task Team on Satellite Users Requirements

TCC: Tropical Cyclone Committee for the South Pacific and South-East Indian Oceans

TT-SWFD/DPFS: Task Team on Severe Weather Forecast and Disaster Risk Reduction including Data Processing and Forecasting System
TT-CISS: Task Team on Coastal Inundation including Storm Surge

Annex XIV

World Meteorological Organization RA V-16/INF. 1

REGIONAL ASSOCIATION V
(SOUTH-WEST PACIFIC) Date: 18.III.2014

SIXTEENTH SESSION Original language: English
Jakarta, Indonesia, 2 to 8 May 2014

MATERIAL ARRANGEMENTS FOR THE SESSION

Venue

1. At the kind invitation of the Government of the Republic of Indonesia, the sixteenth session of Regional Association V (South-West Pacific) will be held at the Auditorium of the Agency for Meteorology, Climatology and Geophysics (BMKG) in Jakarta from 2 to 8 May 2014. The opening ceremony will take place at 10 a.m. on Friday, 2 May 2014. The session will be preceded by a WMO RA V Regional Conference from 30 April to 1 May 2014, at the same venue.

2. The main meeting room will be equipped for simultaneous interpretation. Other meeting rooms without interpretation facilities will also be available. Detailed arrangements concerning the allocation of these rooms will be announced during the session.

3. An Information and Registration Desk will be set up at the main entrance of the Auditorium of the BMKG headquarters. It will handle the registration of participants and the provision of general information.

Registration of participants

4. Registration for RA V-16 will take place at the registration desk at the main entrance of the Auditorium as from Thursday, 1 May 2014, from 16.00, and will continue throughout the session. Participants will receive identification badges at the time of registration.

Credentials

5. Pursuant to Regulation 21 of the General Regulations, prior to a session of a constituent body other than the Executive Council, each Member should, if possible, communicate to the Secretary-General the names of the persons composing its delegation to that body, indicating which of these shall be regarded as its principal delegate. Besides this communication, a letter giving these particulars and otherwise conforming with the provisions of the Convention and of these Regulations and signed by, or on behalf of, an appropriate governmental authority of the Member, shall be sent to the Secretary-General or handed to his representative at the session and shall be regarded as appropriate credentials for the participation of the individuals named therein in all activities of the constituent body.

List of participants

6. A provisional list of participants will be uploaded on the website of the session. This list will be revised as soon as participants have registered, and a new list will be re-uploaded, if necessary.

Submission of documents

7. Delegations wishing to submit documents before the session are invited to send them to the WMO Secretariat as soon as possible, but not later than sixty days before the opening of the session, according to the provisions of Regulation 173 (b) of the WMO General Regulations to allow time for translation. According to Regulation 172 of the WMO General Regulations, session documents should be distributed as soon as possible and preferably not later than forty-five days before the opening of the session. Any document presented by a delegation should be submitted in the name of the Member of the Organization and not by an individual person.

Distribution of documents

8. Documents will be posted before and during the session on the RA V-16 website, in line with WMO greening efforts to promote paperless meetings.

Documentation workflow

9. The presentation of the session documents and organization of the work of the session is explained at the RA V-16 website http://rav-16.wmo.int. The participants are invited to bring their own laptops, as the documents will only be available electronically.

Provisional abridged report

10. Approved documents showing amendments will be posted on the RA V-16 website as soon as possible after the session. Approved files of documents discussed during RA V-16 will be placed in the folder “Provisional Final Report” that will appear on RA V-16 website.

Internet access and communications

11. Wireless Internet connection will be freely available at the venue. A videoconference connection between the WMO headquarters in Geneva and the main meeting room will be available. Computers with Internet connections will be available at the session venue. Mail for conference participants may be addressed as follows:

Local Coordinator for RA V-16
Mr Maman Sudarisman / Mrs Anni Arumsari
The Indonesia Agency for Meteorology, Climatology and Geophysics (BMKG)
Jl. Kemayoran I No 2, Jakarta Pusat, 10720
Republic of Indonesia

Telephone: (6221) 6546339, 4246321 ext. 2218, 2119
Fax: (6221) 6546339
E-mail: Maman_sudarisman@yahoo.com,
arumsari_anni@yahoo.com, anni.arumsari@bmkg.go.id

12. Local SIM cards for mobile phones will be available for purchase by participants at the Information and Registration Desk.

Entry requirements

13. All participants requiring a visa to enter Indonesia should apply for their visa directly from the Embassy or Consulate-General of the Republic of Indonesia in their country, or a designated country in cases where no Indonesian Embassy or Consulate is available in their own country. Diplomatic and service visas and entry permits, where required, shall be granted free of charge and as speedily as possible for their effective participation throughout the duration of the

meeting, provided the application for the visa is made sufficiently in advance, i.e. more than one month before the beginning of the session.

14. If there is no Embassy or Consulate-General of the Republic of Indonesia in the participant's country, the participants may be able to apply for Visa on Arrival (VoA) by sending prior information, such as the invitation letter from WMO, a letter of visa request and copies of their passport to the Indonesia Agency for Meteorology, Climatology and Geophysics (BMKG) with a copy to the WMO Secretariat, not later than one month prior to the session. Please note that, prior to your departure, you need to obtain confirmation from BMKG that your application for Visa on Arrival (at Jakarta, Soekarno-Hatta International Airport) has already been cleared.

15. A number of Local Organizing Committee staff will be available at the airport to assist participants upon their arrival.

Banking and Currency

16. There are currency exchange offices in Soekarno Hatta airport as well as in all banks (opening hours are 9 a.m. to 3 p.m.). The local currency is the Indonesia Rupiah (US$ 1 ≈ 10,500-11,500 Rupiah). Credit cards are accepted at major hotels.

Transportation

17. Transport will be provided free of charge from the airport to the hotels and from the hotels to the venue of the session. You are kindly requested to notify the host country early in advance of any changes in your flight schedule.

Tours and excursions

18. An excursion will be organized by the host for the participants of the session.

Local climate in May

19. Climate data in May in Jakarta, Indonesia are listed below:

Mean temperature:	+ 28.3°C
Mean maximum temperature:	+ 32.6°C
Mean minimum temperature:	+ 25.1°C
Mean precipitation	9.4 mm
Humidity	77.4%
Mean duration (%) of sunshine	53.3%

Hotel reservation

20. Participants are advised to make their own accommodation bookings well in advance, **preferably before 25 March 2014**. Appendix A contains a list of recommended hotels in Jakarta, Indonesia where special rates have been negotiated with some of them. When booking, you must provide details of your credit card for guarantee (type and No., name, expiry date). Bookings shall be made by faxing the Hotel Reservation Form contained in Appendix B to the local coordinator for RA V-16. A view of the area in the vicinity of the conference site is contained in Appendix C.

Further information

21. For any further information please contact the WMO Secretariat or the Local Organizing Committee at the following address:

Local Coordinator for RA V-16
Mr Maman Sudarisman / Mrs Anni Arumsari
The Indonesia Agency for Meteorology, Climatology and Geophysics (BMKG)
Jl. Kemayoran I No 2, Jakarta Pusat, 10720
Republic of Indonesia

Telephone: (6221) 6546339, 4246321 ext. 2218, 2119
Fax: (6221) 6546339
E-mail: Maman_sudarisman@yahoo.com, arumsari_anni@yahoo.com, anni.arumsari@bmkg.go.id

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Appendices: 3

APPENDIX A to Annex XIV

LIST OF RECOMMENDED HOTELS

Accommodation in Jakarta	***Address, e-mail, telephone and fax numbers for reservation***	***Rate of the Room/Night***			
Mercure Convention Centre Ancol	Jl. Pantai Indah Taman Impian Jaya Ancol 14430 Jakarta Indonesia Tel: +6221 6406000, 6406123 Website: http://www.mercure.com (WMO special rate)	Superior Room IDR802,000,- (≈68 US Dollars)	Deluxe Ocean IDR1,013,000,- (≈85 US Dollars)	Grand Deluxe IDR1,013,000,- (≈85 US Dollars)	Eexcutive Room IDR1,500,000,- (≈125 US Dollars)
Swiss-Belhotel Mangga Besar	Jalan Kartini Raya No.57 10750 Jakarta Pusat, Indonesia Tel: +6221, 6393 888 Website: http://www.swiss-belhotel.com/en/Indonesia/Jakarta/jakarta#hotel+information (BMKG special rate)	Deluxe IDR 700,000,- (≈60 US Dollars)	Superior Deluxe IDR 750,000,- (≈65 US Dollars)	President Suite IDR 3,500,000,- (≈290 US Dollars)	
Best Western Grand Palace Kemayoran	Jalan Benyamin Suaeb Blok A5 Kemayoran Central Jakarta, 10630, Indonesia Tel: +6221, 6585 3888 Website: http://www.bwgrandpalace.com (BMKG special rate)	Superior IDR 600,000,- (≈50 US Dollars)	Deluxe IDR 700,000,- (≈60 US Dollars)*	Super Deluxe IDR 700,000,- (≈60 US Dollars)*	Junior Suite IDR 800,000,- (≈67 US Dollars)*

Note: These rates include taxes, breakfast, and free wifi access.

**** laundry is included.***

APPENDIX B to Annex XIV

HOTEL RESERVATION FORM

Participants attending RA V-16 are welcome to make their hotel reservation directly with the hotel by fax or mail, or return the form no later than **25 March 2014** to:

Mr Maman Sudarisman **Tel.: (6221) 6546339, 4246321 ext. 2218, 2119**

Mrs Anni Arumsari **Fax: (6221) 6546339**

Jl. Kemayoran I No 2, Jakarta Pusat, 10720 Indonesia

e-mail: maman_sudarisman@yahoo.com
arumsari_anni@yahoo.com,
anni.arumsari@bmkg.go.id

Name _____

Country _____

Address _____

Tel. No. _____

Fax No. _____

E-mail _____

	Flight No.	*Date*	*Time*
Arrival	_____	_____	_____
Departure	_____	_____	_____

Please reserve

Name of hotel: _____

Please specify one of the recommended hotels

Standard/Superior/Deluxe/Suite: Single ( ) Twin ( )

Check-in date _____

Check-out date _____

Credit card details for guarantee:

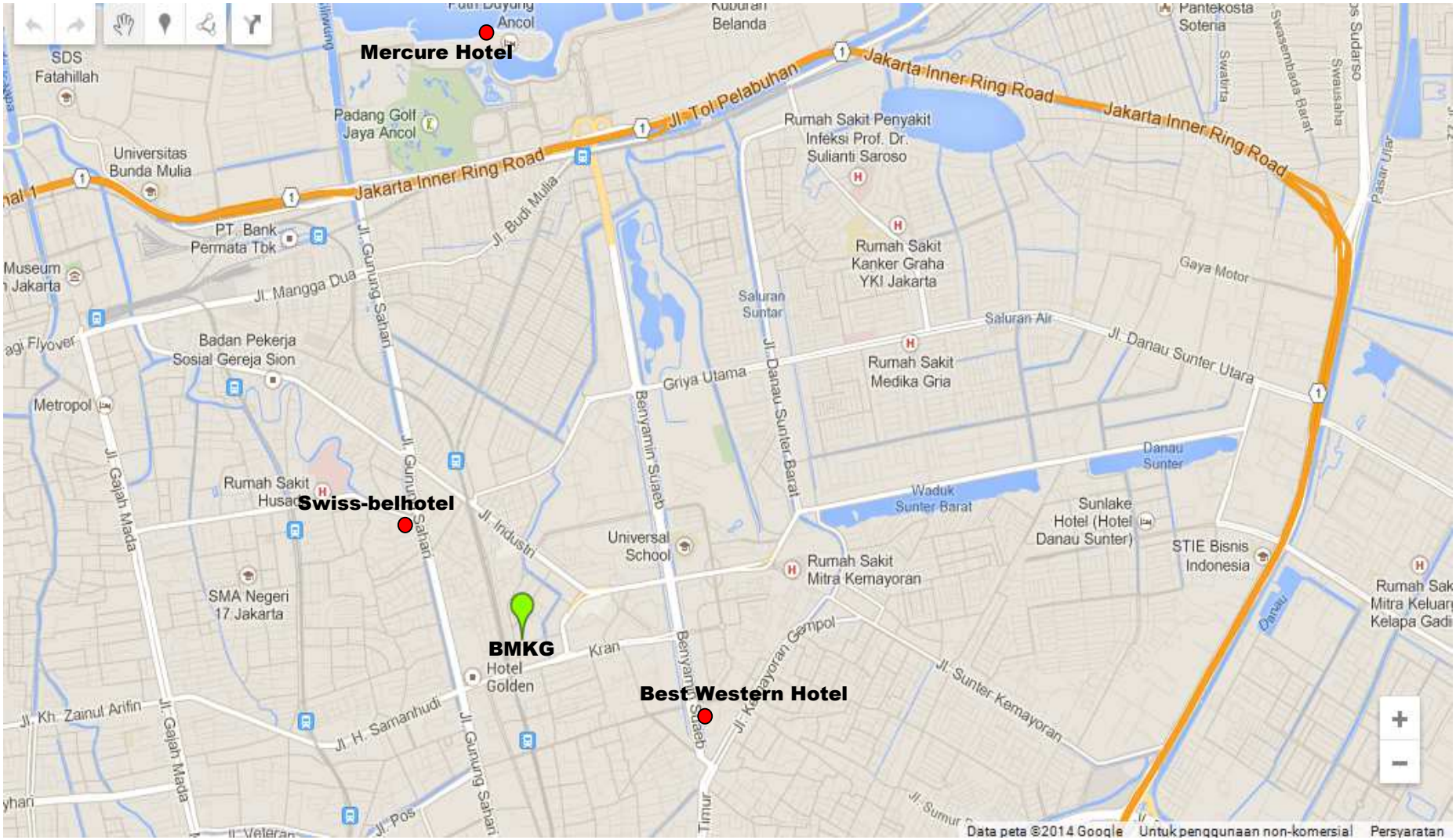
Type _____ Number _____

Name _____Expiry Date _____

Date _____ Signature _____

APPENDIX C to Annex XIV

HOTELS and BMKG



Annex XV

TENTH SESSION OF THE RA V MANAGEMENT GROUP
(Jakarta, Indonesia, 14 to 15 March 2014)

LIST OF REGIONAL EVENTS IN RA V
(May 2013-May 2014)

List of WMO organized, co-organized, and other related events in RA V

Date	Event	Place
Part I: WMO Constituent Bodies' Sessions and RA V Technical Conferences / Regional Seminars		
2014		
30 April – 1 May 2014	Sixth Regional Conference on Management of Meteorological and Hydrological Services in Regional Association V (South-West Pacific)	Jakarta, Indonesia
25-28 February 2014	Fifth session of the Executive Council Panel of Experts on polar observations, research and services	Wellington, New Zealand
Part II: RA V Subsidiary Bodies' Meetings / Sessions		
2014		
26-30 May 2014	Fifteenth session of RA V Tropical Cyclone Committee for the South Pacific and South-East Indian Oceans (RA V TCC) (RA V/TCC-15)	Port Vila, Vanuatu
2-8 May 2014	Sixteenth session R A V	Jakarta, Indonesia
14-15 March 2014	Tenth session of RA V Management Group (RA V/MG-10)	Jakarta, Indonesia
2013		
25-29 November 2013	Eight session of RA V Working Group on Hydrological Services (RA V WG/HYS-8)	Christchurch, New Zealand
15 May 2013	Ninth session of RA V Management Group (RA V/MG-9)	Geneva, Switzerland
Part III: Other Meetings, Workshops and Training Courses		
2014		

Date	Event	Place
August 2014	AusAID/BoM Pacific Sector Linkage Programme (PSLP) – Training and implementing systems for participation by Pacific countries in open international exchange of meteorological information – Expert services to assist Tuvalu to implement WIS.	Funafuti, Tuvalu
July 2014	AusAID/BoM PSLP – Training and implementing systems for participation by Pacific countries in open international exchange of meteorological information – Expert services to assist Niue to implement WIS.	Alofi, Niue
10-17 April 2014	AusAID/BoM PSLP – Training and implementing systems for participation by Pacific countries in open international exchange of meteorological information – Expert services assisted Cook Islands and Tonga to implement WIS.	Rarotonga, Cook Islands and Nuku'alofa, Tonga
7-11 April 2014	Finnish-Pacific project to support the first national/community-based application of climate services in Cook Islands	Rarotonga, Cook Islands
4 April 2014	Regional stakeholders consultations workshop on Finland-Pacific Project	Rarotonga, Cook Islands
3-4 March 2014	Finnish-Pacific project to support a regional stakeholders consultation workshop for the implementation of component 2 of the project – application of climate services to communities' activities	Apia, Samoa
1-9 March 2014	AusAID/BoM PSLP – Training and implementing systems for participation by Pacific countries in open international exchange of meteorological information – Expert services assisted Samoa and Kiribati to implement WIS.	Apia, Samoa and Tarawa, Kiribati
29 January – 5 February 2014	AusAID/BoM PSLP – Training and implementing systems for participation by Pacific countries in open international exchange of meteorological information – Expert services assisted Vanuatu and Fiji to implement WIS.	Port Vila, Vanuatu and Nadi, Fiji
22 January 2014	Finnish-Pacific project funded planning	Apia, Samoa

Date	Event	Place
	meeting on lightning data usage	
2013		
13-21 November 2013	AusAID/BoM PSLP – Training and implementing systems for participation by Pacific countries in open international exchange of meteorological information – Expert services assisted Papua New Guinea and Solomon Islands to implement WIS.	Honiara, Solomon Islands and Port Moresby, Papua New Guinea
5-11 October 2013	Third meeting of SOPAC (Division of the Secretariat of the Pacific Community (SPC))	Rarotonga, Cook Islands
1-30 October 2013	Finnish-Pacific project funded expert service to conduct assessments of Regional Basic Synoptic Network (RBSN) in Cook Islands, Niue, Samoa, and Tonga	Cook Islands, Samoa, and Tonga
17-19 September 2013	Twenty-fourth meeting of officials of the Secretariat of the Pacific Regional Environment Programme (SPREP)	Apia, Samoa
13 September 2013	Pacific National Meteorological Services (NMSs) and the University of the Pacific (USP) dialogue on education and training in the fields of meteorology, climatology and hydrology	Suva, Fiji
9-12 September 2013	Finnish-Pacific project funded workshop on joint platform for sharing warnings in the Pacific	Suva, Fiji
1 August – 30 September 2013	Finnish-Pacific project funded expert services to install and provide training on SmartMet technology for Samoa and Solomon Islands	Samoa, and Solomon Islands
12 July 2013	Pacific Small Island Developing States (SIDS) preparatory meeting	Nadi, Fiji
8-11 July 2013	Joint meeting of the Pacific Platform for Disaster Risk Management (PPDRM) and the Pacific Climate Change Roundtable (PCCR)	Nadi, Fiji
1-5 July 2013	Nineteenth regional meeting of disaster	Nadi, Fiji

Date	Event	Place
	managers	
1-5 July 2013	Strategic alliance of Pacific Islands disaster, fire and emergency services and police	Nadi, Fiji
Part IV: Other WMO and RA V Sponsored and/or Co-sponsored Meetings, Workshops, and Training Courses		
2014		
3 April 2014	WMO organizing a regional stakeholders consultations workshop on the Canada project	Rarotonga, Cook Islands
3 April 2014	WMO organizing a meeting for Least Developed Countries (LDCs) and Small Island Developing States (SIDS)	Rarotonga, Cook Islands
30 March –2 April 2014	WMO organizing a workshop on the Global Framework for Climate Services (GFCS) for the Pacific region	Rarotonga, Cook Islands
11-15 January 2014	WMO funded expert services assisted and provided training to the Solomon Islands Meteorological Service's staff to prepare and issue TAF and SIGMET	Honiara, Solomon Islands
2013		
12-15 November 2013	WMO seventh Tropical Cyclone Regional Specialized Meteorological Centers/Tropical Cyclone Warning Centers (RSMCs/TCWCs) technical coordination meeting	West Java, Indonesia
2-4 October 2013	WMO/BoM/Government of Fiji co-organized tenth southern hemisphere workshop on public weather services	Nadi, Fiji
23 September – 1 October 2013	WMO/BoM/Government of Fiji co-organized tenth southern hemisphere training course on tropical cyclones	Nadi, Fiji
11-12 September 2013	International workshop on the GAW programme in tropical regions	Jakarta, Indonesia
26-29 August 2013	Meeting of the Regional Subproject Management Team (SMT) for the	Nadi, Fiji

Date	Event	Place
	Severe Weather Forecast and Disaster Risk Reduction Project (SWFDDP) in the South Pacific	
15-19 July 2013	Finnish-Pacific Project/WMO/BoM co-funded first workshop on competency requirements for aviation meteorology personnel and consequences for quality management system for aviation weather services	Apia, Samoa
1-5 July 2013	SPREP/WMO co-organized second meeting of Pacific Meteorological Council (PMC-2)	Nadi, Fiji
July 2013 – June 2014	Hydrologists Training Course at WMO Regional Training Center (RTC) – Philippines	Quezon City, Philippines

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PLAN FOR REGIONAL EVENT
DURING THE SIXTEENTH FINACIAL PERIOD (2012-2015)

Year / Regional Event	2012	2013	2014	2015
Sixteenth session of the Association			2-8 May 2014 Jakarta, Indonesia	
Meeting of the Management Group	28 June & 2 July 2012 Geneva	15May 2013 Geneva	14-15March 2014 Jakarta, Indonesia 23June 2014 Geneva	May 2015 Geneva
Tropical Cyclone Committee for the South Pacific and South-East Indian Ocean	16-20July 2012 Apia, Samoa		26-30May 2014 Port Vila, Vanuatu October 2014 CIFDP-1	
Working Group on Hydrological Services		25-29November 2013 Christchurch, New Zealand		
Working Group on Climate Services				
Working Group on Weather Services			May/June 2014 Nadi, Fiji	
Working Group on Infrastructure		24-27April 2013 Melbourne, Australia		
Regional Conference on the Management of Meteorological and Hydrological Services			31MarchI-1April 2014 Jakarta, Indonesia	
Regional Seminar				October/November 2015

Budget Allocation approved by Cg-XVI (ref. WMO Operating Plan 2012-2015)

Regional Association V session	2014	CHF 159,772
RA V Regional Seminar	2015	CHF 29,872
RA V Technical Conference	2013	CHF 92,132
RA V Management Group Meeting	2014	CHF 24,964
Tropical Cyclone Committee	2012	CHF 13,819
	2014	CHF 13,481
Working Group sessions	2012	CHF 16,377
	2013	
	2014	CHF 15,977
	2015	CHF 15,932
Assistance to President of RA V	2012-2015	CHF 16,166
Regional Workshop for South-West Pacific	2012	CHF 20,472
Regional Workshop for SIDS	2012	CHF 20,472

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TENTH SESSION OF THE RA V MANAGEMENT GROUP
(Jakarta, Indonesia, 14 to 15 March 2014)

World Meteorological Organization		**RA V-16/Doc. 3**
REGIONAL ASSOCIATION V (South West Pacific)	Submitted by:	President of RA V
	Date:	5.III.2014
FIFTEENTH SESSION Jakarta, Indonesia, 2 to 8 May 2014	Original Language:	English
	Status:	**DRAFT 1**

EXPECTED RESULT 8

AGENDA ITEM 3: Report by the president of the association

SUMMARY

DECISIONS/ACTIONS REQUIRED:

To adopt the draft text for inclusion in the general summary.

CONTENT OF DOCUMENT:

The Table of Contents is available only electronically as a Document Map*.

* In MS Word 2007 or 2003, go to "View" > "Document Map", or click on the "DocMap" button on the "WMO Tools" toolbar. In MS Word 2010, go to "View" > "Navigation Pane". In MS Word on a Mac, go to "View" > "Navigation Pane", select "Document Map" in the drop-down list on the left.

APPENDIX A to Annex XVI:

DRAFT TEXT FOR INCLUSION IN THE GENERAL SUMMARY

3. Report by the president of the association (*AGENDA ITEM 3*)

3.1 The Association noted with appreciation the report of the president of RA V which provided an overall review and assessment of the major activities of the Association since its fifteenth session and expressed satisfaction at the effective manner in which the activities of the Association were being undertaken. The president also highlighted the issues that the Association would have to continue to address, such as the implementation of the RA V Strategic Operating Plan (SOP) 2012-2015 and the development of the RA V Operating Plan (OP) 2016-2019; the working mechanism of the Association; and other current and future priority activities, including the implementation in the Region of the high priority activities decided by the Sixteenth Congress (2011) in the areas of: GFCS; WIGOS and WIS; aeronautical meteorology; capacity development; and disaster risk reduction.

3.2 The Association commended its president, Dr Sri Woro B. Harijono (Indonesia) for her leadership, dedication, enthusiasm and initiative with which she has conducted the affairs of the Association, thus contributing to the further development of weather, climate and water services in the Region. The Association also commended the vice-president, Mr 'Ofa Fa'anunu (Tonga), for his valuable contribution to the Association and its subsidiary bodies as well as the work of the Region. It also expressed its appreciation to the Chairperson, Leads and members of the subsidiary bodies who had effectively collaborated in carrying out the activities of the Association.

3.3 The Association extended its appreciation to Members who hosted and/or co-sponsored various regional events during the intersessional period and encouraged them to continue to provide the necessary support to the future activities of the Association. *[A list of regional events during the period 2010-2014 is given in RA V-16/INF. 3.]*

3.4 The Association reaffirmed the importance of the establishment and enhancement of multi-hazard early warning systems in the Region in light of disastrous tropical cyclones/typhoons, floods, earthquakes and tsunamis, such as Typhoon *Haiyan* (Yolanda) in the Philippines in November 2012; Tropical Cyclone *Ian* in Tonga in January 2014; Tropical Cyclone *Evan* devastated Fiji and Samoa in December 2012; the two flood incidents in Fiji in January and March 2012; and the tsunami event in the Solomon Islands in February 2012. The Association requested the Secretary-General to continue to provide assistance to RA V Members, in particular, developing countries, Least Developed Countries (LDCs) and Small Island Developing States (SIDS), in this regard.

3.5 The Association noted with satisfaction the successful implementation of regional components of WMO programmes and projects in the Region, such as the Severe Weather Forecasting and Disaster Risk Reduction Demonstration Project (SWFDDP) *[refer to RA V-16/Doc. 4.3(1)]* and the Fiji Coastal Inundation Forecasting Demonstration Project (CIFDP-F), and Indonesia Coastal Inundation Forecasting Demonstration Project Stakeholder Workshop (CIFDP-ISW) *[also refer to RA V-16/Doc. 4.3(3)]* in the Region. In view of recent disastrous events, such as a vessel capsizing in high winds, rough seas and heavy swells and 200 loss of lives in Papua New Guinea in 2011, and the 2012 floods which caused damages to economy and infrastructure of Fiji, the Association requested the Secretary-General to provide assistance to Members for the continuous implementation of these projects and their extension to other Members.

3.6 The Association acknowledged and commended the activities of the working groups in RA V especially those aimed at establishing a Regional Climate Centre (RCC) network and implementation of Regional/Sub-regional Climate Outlook Forums (RCOFs), including the ASEAN Climate Outlook Forum (ASEANCOF) which started by a successful Training CLIPS in 2011 in Indonesia. The Association welcomed the establishment of Regional Training Center in Indonesia that already hosted several activities including the WMO Regional Training Seminar for National Trainers for RA II and RA V in 2013, Training Course on Satellite and Radar Interpretation in 2012 and SEA HYCOS meeting in 2012.

3.7 The Association expressed its appreciation and commended the activities of the Working Group on Weather Services which had been aimed at assisting NMHSs in the Region to meet ICAO requirements for quality management and competency for aviation weather services. The Association requested the Secretary-General and Members to continue to provide assistance to help RA V Members especially LDCs and SIDS NMHSs become compliant with ICAO requirements *[ref. RA V-16/Doc. 4.1(2)].*

3.8 The Association recognized the major achievements and progress in the Region including, among others:

(a) Development of a Regional WIGOS Implementation Plan for RA V (R-WIP-V) and a Regional WIS Implementation Plan for RA V *[ref. RA V-16/Doc. 4.4(1) and Doc. 4.4(3)]*;

(b) Establishment of a WMO RTC in Indonesia;

(c) Increased number and stabilization of meteorologists/tropical cyclone forecasters at RSMC Nadi; and

(d) Further enhancement of the partnership with SPREP through the Pacific Meteorological Desk Partnership (PMDP) and the Pacific Meteorological Council (PMC) *[ref. RA V-16/Doc. 4.7(1) and Doc. 8]*.

3.9 The Association reaffirmed the importance and its commitment to the implementation of RA V SOP 2012-2015 and the development of RA V OP 2016-2019 as its contribution to the development and implementation of the WMO SP and OP 2016-2019.

3.10 The Association expressed its appreciation to the Secretary-General and its Members for the continued support for the development of human resources and building institutional capacity in the Region. The Association requested the Secretary-General and its Members to continue providing support and assistance to RA V Members especially developing countries, LDCs and SIDS.

3.11 The Association was pleased note that the Regional Office for Asia and the South-West Pacific in Geneva and the WMO Office for the South-West Pacific in Samoa have played an important role in various regional capacity development activities, facilitating implementation of WMO regional events, maintaining close contact with Members, providing support to meet Members' requirements; and participating in various WMO activities, in close collaboration with Members and partner organizations in the Region.

3.12 The Association expressed a warm welcome to Tuvalu for a new membership with WMO (23rd Member of RA V) as from 22 September 2012. It encouraged Marshal Islands, Nauru and Palau to take the necessary steps to becoming Members of WMO.

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APPENDIX B to Annex XVI:

PROGRESS REPORT FOR INFORMATION –
NOT TO BE INCLUDED IN THE GENERAL SUMMARY

SUMMARY OF THE REPORT BY THE PRESIDENT OF THE ASSOCATION

Introduction

1. This report covers the period from the fifteenth session of the Association to April 2014.

MEMBERS OF THE ASSOCIATION

2. The number of Members of the Association is 23 with Tuvalu becoming a Member of WMO on 22 September 2012.

Officers of the Association

3. Dr Sri Woro B. Harijono (Indonesia) and Mr ‘Ofa Fa’anunu (Tonga) served as president and vice-president of the Association, respectively.

Subsidiary bodies of the Association

4. At its fifteenth session, the Association established the Management Group, the Tropical Cyclone Committee (TCC) and four Working Groups on: Infrastructure (WG-INFR); Weather Services (WG-WXS); Climate Services (WG-CLS); and Hydrological Services (WG-HYS). The Management Group, TCC and working groups worked satisfactorily.

5. The future working mechanism including the (re-)establishment of working groups will be discussed at the sixteenth session of the Association *[ref. RA V-16/Doc. 5.3(1)].*

Major regional events and outcomes

6. During the period of the report, a number of seminars, workshops and other events were organized or hosted by WMO and its Members. Members of the Association actively participated in these events *[ref. RA V-16/INF. 3].*

WMO Regional Office for Asia and the South-West Pacific and the WMO Office for the South-West Pacific

7. The Regional Office for Asia and the South-West Pacific, located at the WMO Headquarters in Geneva, has been providing effective support to NMHSs in their efforts to enhance their services as well as to the president, vice-president and subsidiary bodies of the Association in discharging their responsibilities.

8. The WMO Office for the South-West Pacific, located in Apia, Samoa has been facilitating implementation of WMO regional events, maintaining close contact with Members, providing support to meet requirements of Members in the Region and also to address WMO cross-cutting programmes with relevant regional organizations and UN system agencies. *[The activities of the Regional Office and the WMO Office for the South-West Pacific are presented in RA V-16/Doc. 8.]*

Missions of the president

9. In her capacity as the president of RA V, Dr Harijono attended the Sixteenth Congress, the sessions of the Executive Council and meetings of the Financial Advisory Committee and the WMO Bureau as well as the Meetings of Presidents of Regional Associations and Joint Meetings of the Presidents of Regional Associations and Presidents of Technical Commissions.

Future work of the Association

10. Human resources and institutional capacity development would continue to be a high priority for Region V especially for developing countries, LDCs and SIDS.

11. High priority should also be given to the following activities:

(a) Quality management, competency, and cost recovery especially in developing countries, LDCs and SIDS;

(b) Implementation of the RA V SOP 2012-2015 and the development of RA V Operating Plan 2016-2019, as contribution to WMO OP 2016-2019 [*[ref. RA V-16/Doc. 5.2 and INF. 5.2]*;

(c) Execution of the Regional WIGOS Implementation Plan for RA V and the Regional WIS Implementation Plan for RA V;

(d) Further development of SEA-HYCOS and Pacific-HYCOS projects; and

(e) Establishment of an RA V RCC network, which will contribute to the implementation of GFCS at national and regional levels.

12. Members and WMO should also give high priority to non-tropical cyclone related extreme weather events in order to be able to address the future challenges.

Acknowledgements

13. The president of the Association would like to express her appreciation and gratitude to all those who have contributed to the work of the Association. Particular thanks are due to the vice-president, Mr ‘Ofa Fa’anunu, and the Chairperson, Leads and members of subsidiary bodies of the Association. Thanks are due to the Members of the Association who have hosted various meetings, conferences and training events during the intersessional period.

14. The president would also like to express her deep gratitude and appreciation to the Secretary-General of WMO and to the Secretariat, in particular the Regional Office for Asia and the South-West Pacific and the WMO Office for the South-West Pacific, for their valuable support and advice in the work of the Association.

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