

**FIFTH TECHNICAL CONFERENCE ON MANAGEMENT OF  
METEOROLOGICAL AND HYDROLOGICAL SERVICES IN  
REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC)**

***STRATEGIC CAPACITY DEVELOPMENT OF  
NMHSs IN RA V***

***(Kuala Lumpur, 20 to 24 April 2009)***

**FINAL REPORT**



**WORLD METEOROLOGICAL ORGANIZATION**



## 1. OPENING OF THE CONFERENCE

1.1 At the kind invitation of the Government of Malaysia, the Fifth Technical Conference on the Management of Meteorological and Hydrological Services in Regional Association V (South-West Pacific) was held in Kuala Lumpur, Malaysia, from 20 to 24 April 2009, with the theme of "Strategic Capacity Development of NMHSs in RA V".

1.2 Twenty-four Directors and Senior Officials of National Meteorological and Hydrological Services (NMHSs) from 16 Members in Region V, and a representative of an international organization and an invited lecturer attended the Technical Conference. The list of participants and the programme of the Conference are given in Annexes I and II, respectively.

1.3 Dr Yap Kok Seng, Permanent Representative of Malaysia with WMO and Director-General of the Malaysian Meteorological Department (MMD) welcomed the participants and expressed his gratitude to WMO for its continued commitment towards enhancing Members of Region V in the planning, implementing and delivering meteorological and hydrological services. Dr Yap noted that a series of Technical Conferences had been one of WMO's efforts in Region V for Members to share experiences, best practices and knowledge on the operation of NMHSs. The Conference has also provided an opportunity to discuss ways to advance NMHSs in the 21st Century towards meeting Members' growing needs for accurate, timely and long-range weather and climate information and forecasts. He concluded by emphasizing that the need for climate information for adaptation to climate change is rapidly increasing.

1.4 Speaking on behalf of Mr Michel Jarraud, Secretary-General of WMO, Dr Tokiyoshi Toya, Regional Director for Asia and the South-West Pacific, welcomed all the participants and expressed his appreciation to the Government of Malaysia through H.E. Datin Paduka Prof. Dr Khatijah Mohd Yusoff, for hosting the Fifth Technical Conference. He extended his gratitude to Dr Yap, Permanent Representative of Malaysia with WMO and his staff for the warm welcome and hospitality and for the excellent arrangements made to ensure the success of the Conference. In referring to the progress in the development of the draft RA V Strategic Plan (2009-2011), Dr Toya noted that this Technical Conference would provide an excellent opportunity to review and further develop it in alignment with the WMO Strategic Plan (2008-2011) and with strategic links to regional and national priorities. He stressed the need for strengthening the capacity of NMHSs to improve the delivery of weather, climate and water services and to implement quality management standards in NMHSs. In ensuring WMO's continued support to Members' efforts to contribute to national and regional sustainable development, he wished the participants a very successful Conference and a pleasant stay in Kuala Lumpur.

1.5 Dr Sri Woro B. Harijono, vice-president of RA V expressed her sincere gratitude to the Ministry of Science, Technology and Innovation (MOSTI) of Malaysia and MMD for their invaluable hospitality. Dr Harijono, in referring to the topic of strategic planning and management of NMHSs, stressed that the programmes of NMHSs should be formulated within the framework of WMO Strategic Plan (2008-2011) and within the strategic planning and management of each individual NMHS in RA V. She noted that in addition to building close partnerships with the public users of weather, climate and water information, and with governmental authorities, NMHSs should also build closer partnerships with industries and manufacturers of observation instruments. It is necessary to improve working relationships with manufacturers regarding the modification and/or upgrading of instrument specifications which are increasingly in demand and required for multiple hazard detection purposes.

1.6 H.E. Datin Paduka Prof. Dr Khatijah Mohd Yusoff, Deputy Secretary-General (Science) for MOSTI of Malaysia, on behalf of the Government and the people of Malaysia, extended the message of peace, solidarity and warm greetings and a very warm welcome to the participants. She emphasized that many Members of RA V had recorded economic growth, however, the exploitation of natural resources, urbanization, industrialization and economic development had led to land degradation, environmental pollution and climate change. In addition, she emphasized that climate variability had continued to pose stress to sustainable development.

NMHSs have a very significant role through issuing effective, accurate, sufficient lead-time weather, climate and water information including warnings to reduce the risks and impacts associated with extreme weather and climate events. NMHSs also have a very important role through issuing of accurate climate prediction and information for adaptation to climate change initiatives. Although NMHSs in Region V vary in size, status of advancement and development, they share common regional issues that would require collective and coordinated efforts to address them. She also emphasized that it is the responsibility of NMHSs to take advantage of these challenges and turn them into opportunities by exploiting the rapid changing technological innovation, globalization, commercialization and emerging results of scientific researches. It is important for NMHSs in Region V to work together as a team to develop a strategic approach to address these issues for the benefits of future generations. It is also very important to develop partnerships with other international organizations, academia, the media and the private sector, and to put in place efficient management and good governance to ensure affordable weather, climate and water information. Wishing all the participants a very successful and fruitful Conference and an enjoyable stay in Malaysia, she officially declared the Technical Conference open.

## **2. SUMMARY OF DISCUSSIONS**

2.1 Following an introduction to the Technical Conference by Dr T. Toya (WMO), lectures and case studies were presented by Directors and senior officials of NMHSs, a representative of an international organization, an invited lecturer, and staff of the WMO Secretariat on the following topics of the Conference:

- Topic 1: Strategic Planning and Management of NMHSs;
- Topic 2: Socio-economic Benefits of Weather, Climate and Water Services;
- Topic 3: Building Partnerships with Stakeholders and Public Relationships;
- Topic 4: Human Resources Development and Training Opportunities;
- Topic 5: Emerging Technology including Information and Communication Technology (ICT);
- Topic 6: Quality Management Practices;
- Topic 7: Disaster Risk Reduction;
- Topic 8: Climate Prediction and Information for Decision-Making.

2.2 Following discussions on the various presentations under each topic, the Conference came to the conclusions and recommendations as given below.

## **3. STRATEGIC PLANNING AND MANAGEMENT OF NMHSs (Topic 1)**

3.1 Dr T. Toya (WMO) presented the Top-level Objectives (TLOs), Strategic Thrusts (STs) and Expected Results (ERs) of the WMO Strategic Plan (2008-2011) and the on-going approach to develop the next Strategic Plan. Dr Toya informed the Conference of the Executive Council's decision during its sixtieth session in June 2008 (EC-LX) that has urged Regional Associations to complete the development of their Regional Strategic Plans, taking into account specific regional needs and requirements. Dr Toya also introduced the experiences gained during the development of the Strategic Plan for the Enhancement of NMHSs in Regional Association II (Asia) (2009-2011), as it had already been adopted by Members of RA II during their fourteenth session in Tashkent, Uzbekistan, in December 2008 (XIV-RA II). The Conference noted that the RA II Strategic Plan was developed on the basis of its related survey results. The survey was based on capacity needs of NMHSs for the period of 2005-2008. The survey also provided analyses of the likely trends, developments, evolving needs and deficiencies in Region II. It also assisted with the identification of a set of deliverables. Dr Toya invited the Conference to take a similar approach to RA II to further develop the draft RA V Strategic Plan (2009-2011), by reviewing the progress of the implementation of RA V Strategic Goals as identified during the RA V Regional Seminar (Kuala Lumpur, Malaysia, April 2007), recognizing evolving needs in

Region V, and prioritizing the possible regional expected results and deliverables.

3.2 The Technical Conference noted that WMO has adopted the Results-Based Management (RBM) approach and that the WMO Strategic Plan (2008-2011), the WMO Secretariat Operating Plan (2008-2011), and the Monitoring and Performance Evaluation (M & E) Plan are integral part of the strategic planning processes. Dr Toya informed the Conference that Cg-XV (2007), EC-LIX (2007) and EC-LX have already endorsed the schedule, process and guidance for the formulation and delivering of the new WMO Strategic Plan for the period 2012-2015.

3.3 The Technical Conference noted that the WMO Strategic Plan (2008-2011) resulted from a planning process driven by needs and priorities identified by Members of WMO. It has defined the TLOs for WMO to effectively develop and coordinate its plans and programmes for implementation, consequently enabling Members to collectively perform their activities and operations. The WMO Strategic Plan (2008-2011) is addressing the activities and operations of the whole of WMO including its Members and their NMHSs, as well as the Secretariat.

3.4 Mr G. Foley (Australia: Chair of the Task Team on RA V Strategic Plan) introduced the draft Strategic Plan for the Enhancement of Meteorological and Hydrological Services in Regional Association V (South-West Pacific) (2009-2011). It included the purpose, vision, mission, countries and organizations involved, and steps for its implementation. Mr Foley reminded the Conference participants that the Regional Association V during its fourteenth session (XIV-RA V) in Adelaide, Australia, in May 2006 identified challenges and opportunities for Members of RA V, and the RA V Regional Seminar (Kuala Lumpur, Malaysia, April 2007) identified 11 RA V Strategic Goals with proposed strategic actions.

3.5 The Technical Conference noted with appreciation the extensive work carried out by the Task Team on RA V Strategic Plan on development of the draft RA V Strategic Plan (2009-2011) that has taken into account the 11 RA V Strategic Goals, the WMO Strategic Plan 2008-2011 (WMO-No. 1028) and the WMO Secretariat Operating Plan 2008-2011 (WMO/TD-No. 1417), as well as making reference to similar Strategic Plans developed for Region II (2009-2011) and Region VI (2008-2011). It also took into account prior analyses of regional needs including "*A Needs Analysis for the Strengthening of Pacific Islands Meteorological Services* (August 2000)". The draft RA V Strategic Plan (2009-2011) has included a set of action-oriented regional deliverables, categorized in accordance with WMO's ERs. It also included proposed regional Key Performance Targets (KPTs). The programmes, activities and projects are to be further developed in phases for implementation at the national, sub-regional and regional levels. A preliminary draft Action Plan for the implementation of the RA V Strategic Plan (2009-2011) composed of the deliverables, KPIs and related activities have also been developed and presented at the Conference.

3.6 The Technical Conference also noted the goals of the draft RA V Strategic Plan (2009-2011), namely: improved protection of life, livelihoods and property; increased safety on land, at sea and in the air; sustained economic growth on both developed and developing countries and protection of other natural resources; and improved environmental quality. All of these have set the foundation for the development of the RA V Strategic Plan (2009-2011). The proposed TLOs are: to improve forecasts aimed at providing more accurate, timely and reliable forecasts and warnings; to enhance delivery of information and services; and to continue WMO's critical international role as an authoritative scientific voice through the provision of scientific and technical expertise and advice in support of policy decision making.

3.7 The Technical Conference reviewed the status of the implementation of RA V Strategic Goals and the proposed deliverables identified under regional ERs of the draft RA V Strategic Plan (2009-2011). The Conference agreed on the need for streamlining the proposed regional ERs and deliverables through a survey with participating Members at the Technical Conference to examine the priority needs of Members and define high-priority, realistic and achievable deliverables. Based on the returns from 14 Members, the Conference identified 87 priority deliverables under 35 regional ERs (streamlined from 173 deliverables under 37 ERs).

3.8 Through the survey, the Conference recognized that (a) adaptation to climate change and research on extreme weather and climate events, such as tropical cyclones and storm surges; (b) Regional Climate Centres (RCCs); (c) long-term sustainable operation of services, in particular with highly capable technicians, ongoing and periodic sustainability of supply of consumables and calibration of equipment to meet ISO standards and continued cooperation with partners in developed countries for maintenance facilities; and (d) Quality Management System (QMS) are issues of major concern to all Members of RA V. Special attention was paid to the survey result which indicated that 92% of Members highlighted the importance of qualified maintenance technicians to support the operation and maintenance of the service facilities. The Conference agreed that these items should be highlighted more explicitly and incorporated into the draft RA V Strategic Plan (2009-2011).

3.9 The Technical Conference agreed that RA V Strategic Plan should be a *“living document”* that should further evolve through periodic planning, execution, evaluation and review processes. It recognized that the key to its successful implementation would be through ownership of the Plan by Members themselves, and through collaboration and partnership within and amongst Members of RA V and with other WMO Regions and international collaborating partners.

3.10 The Technical Conference agreed on the need to further improve the draft RA V Strategic Plan (2009-2011) and its formulation process in order to better take into account and reflect the priority requirements and expectations of Members of RA V, especially developing country Members such as Least Developed Countries (LDCs) and Small Island Developing States (SIDS), as well as taking into account the specificity of various RA V programmes such as those of RA V Working Groups. In this regard, the Conference further agreed on the need to develop appropriate, reliable, realistic and easily implementable processes for monitoring and evaluating the implementation of the RA V Strategic Plan.

3.11 In this connection, case studies were presented by representatives of Malaysia, Indonesia and Kiribati on the strategic planning and management of NMHSs.

3.12 Mr T.S. Kang (Malaysia) stated that strategic planning of MMD is aligned to the Malaysian National Mission and MOSTI’s Mission, as well as to the WMO Mission. MMD has taken strategic actions to enhance the Earth Observation Programme and Information and Communication Technology (ICT) system for disaster risk management and for international exchange of weather, climate, water and earthquake data. It has also enhanced its human capacity, public awareness and outreach campaign as well as its delivery system to support the Malaysian Government policy to enhance the public delivery system through the provision of integrated and efficient ICT solutions to ensure easier and speedier access to Government services, especially by the rural communities. Local, regional and international cooperation and collaboration should be enhanced to increase and gain knowledge, experience and best practices. It has always been the hope of MMD that these strategic actions taken by the Department could improve its capacity to respond to the changing needs and technology in providing weather, climate, water and seismological services to enhance national socio-economic activities, sustainable development and disaster management.

3.13 Dr Sri Woro B. Harijono (Indonesia) introduced the strategy in linking up national and international policies in climate change. She provided an overview of the WMO and the United Nations Environment Programme (UNEP) roles in the establishment of the Intergovernmental Panel on Climate Change (IPCC) and the United Nations Framework Convention on Climate Change (UNFCCC) and its related subsidiary bodies overseeing the analysis and international discussions on climate change. The Bureau of Meteorology, Climatology and Geophysics (BMKG) is Indonesia’s National Focal Point for IPCC and the Ministry of Environment is National Focal Point for UNEP and UNFCCC. At a national level, the National Action Plan on Mitigation and Adaptation to Climate Change has provided strategic directions for climate change initiatives in Indonesia, coordinated by the National Council on Climate Change. Indonesia, through BMKG, has been participating in the UNFCCC Subsidiary Body for Implementation (SBI) and

Subsidiary Body for Scientific and Technical Advice (SBSTA). BMKG has continued to work with the water and energy sectors addressing adaptation and mitigation initiatives related to climate change.

3.14 Mr T. Kireua (Kiribati) presented an overview of Kiribati Meteorological Service's organizational structure and its setting within the Government of Kiribati. Its obligation and mission is to provide accurate and timely weather, climate and water information including warnings to support sustainable development, safety, security, search and rescue effort and general well-being of the people of Kiribati. The scope of the Kiribati Meteorological Service for the period 2009-2012 would be to provide and implement plans with appropriate guidelines and resources to achieve its priorities. In addition, the following challenges were identified: gaps in data collection and records; unpredictable electrical power failure; unreliability of Internet connection; and obsolete equipment. In conclusion, Mr Kireua requested assistance from WMO and development partners for education, training and capacity development of Kiribati Meteorological Service personnel.

3.15 Taking the above into consideration, the Technical Conference made a series of recommendations for ways to improve the regional strategic planning process and, through it, the capacity of Members, to better respond to their own needs and expectations and those of other stakeholders. Among others, it underlined the need to:

- (a) Take into account and reflect the priority requirements and expectations of the Members of the RA V, especially developing country Members such as LDCs and SIDS, and enhance effective partnerships within and outside the Region;
- (b) Optimize a number of strategic planning tools available such as lessons learned from WMO and RA II strategic planning processes;
- (c) Make a clear distinction between the roles of Members of RA V and the WMO Secretariat in the implementation of the RA V Strategic Plan;
- (d) Align programmes and working mechanism of the Association to the RA V Strategic Plan;
- (e) Distinguish the collective performance of Members of RA V from that of the WMO Secretariat with respect to improving definition and formulation of the regional ERs and deliverables;
- (f) Further highlight or incorporate issues on adaptation to climate change and research on extreme weather and climate events, RCCs, long-term sustainable operation of services, and QMS in the RA V Strategic Plan;
- (g) Explore possible establishment of a region-wide multi-hazard warning system, including tsunami;
- (h) Strengthen the monitoring, evaluation and reporting components of the RA V Strategic Plan (2009-2011) such as collecting baseline data to measure progress through periodic survey with the RA V survey questionnaire, similar to the RA II survey approach;
- (i) Request RA V Management Group and its Task Team on Strategic Plan to prioritize regional ERs and deliverables for RA V, using the survey analysis carried out during the Conference for Members' priorities, feasibilities and relevance to their respective services;
- (j) Request the WMO Secretariat to provide guidance and assistance to Members on development of their NMHSs' Strategic Plans; and
- (k) Urge Members to mobilize resources from their governments and development partners, including developed Members to implement the RA V Strategic Plan (2009-2011).

#### **4. SOCIO-ECONOMIC BENEFITS OF WEATHER, CLIMATE AND WATER SERVICES (Topic 2)**

4.1 Dr B.-C. Choi (WMO) introduced WMO activities related to socio-economic benefits of weather, climate and water services such as the WMO International Conference on Secure and Sustainable Living that was held in Madrid, Spain in March 2007, referred to as the Madrid Conference, as well as a series of workshops conducted and organized in many parts of the globe. Dr Choi emphasized the Madrid Action Plan, which is to enhance weather, climate and water services provided by the NMHSs to contribute to secure and sustainable living for all the people of the world. He also presented some new areas to be incorporated in the next WMO Strategic Plan including social and economic benefits of NMHSs' services.

4.2 Mr H. Taiki (WMO) presented the outcomes of the WMO Workshop on Coordination and Capacity Building for LDCs in Asia-Pacific that was held in Port Vila, Vanuatu, in October 2008. The workshop was aimed at providing a forum for enhancing partnership and coordination, both at national and regional levels, between government officials for the implementation of the Programme of Action of LDCs for 2001-2010. The Workshop adopted important conclusions and recommendations related to: infrastructure and facilities development; visibility and resource mobilization strategy for LDCs; service delivery mechanism; cooperation frameworks of development partners; needs analysis for positioning NMHSs into the national development framework; and capacity building in management and strategic planning, including aeronautical and marine meteorological issues. The Workshop identified a number of thematic areas on how NMHSs could contribute to LDCs national sustainable development and how to enhance WMO's support to LDCs in Regions II and V.

4.3 The Technical Conference considered that enhancing the information and services provided by NMHSs would also lead to enhancing their visibility to its stakeholders in particular users of weather, climate and water services. The Conference concluded with the need to ensure that:

- (a) Recommendations from the Madrid Conference and the WMO Coordination and Capacity Building Workshop for LDCs in Asia-Pacific are incorporated into Regional Expected Result 9 of the draft RA V Strategic Plan (2009-2011); and
- (b) Regional Expected Result 9 of the draft RA V Strategic Plan (2009-2011) is linked directly to national development priorities of LDCs in Region V.

#### **5. BUILDING PARTNERSHIPS WITH STAKEHOLDERS AND PUBLIC RELATIONSHIPS (Topic 3)**

5.1 Mr P. Lefale (New Zealand) provided a brief summary of MetService's experience in enhancing meteorological services in Pacific Island Countries and Territories (PICTs). MetService worked closely with a number of other development partners such as the UK Met Office, US NOAA, Australian Bureau of Meteorology (BoM), AusAID, NZAID and UK Foreign and Commonwealth Office. It continued to advise and assist PICTs to operate and monitor surface and upper-air programmes and facilitate technical advice through its Operations and Engineering Division. It also continued to work closely with relevant Council of Regional Organizations in the Pacific (CROP) agencies in providing management training and assistance in other operational matters of concern. Selected new projects MetService is presently engaged in include: the upgrading of the upper-air programme in Rarotonga (Cook Islands) with the decommissioning of the Penrhyn upper-air facilities and re-deployment of the equipment to Rarotonga; the upgrading of Tonga's surface observational and telecommunications networks in collaboration with the Japan International Cooperation Agency (JICA); the restoration of a selected number of silent GSN stations in Papua New Guinea; the installation of a new hydrogen generator (proton) for

Port Moresby GUAN programme, a joint project with the Australian BoM and US NOAA GCOS programme; the implementation of the regional Climate Change Risk and Adaptation project (ClimRAP), a joint initiative with the National Institute of Water and Atmospheric Research (NIWA) of New Zealand and the New Zealand Ministry for the Environment (MfE); and the restoration of an automatic weather station (AWS) on Nukunonu, Tokelau. Mr Lefale concluded his presentation by stressing in particular the major and ongoing concern of supplies of consumables and spare parts to ensure the sustainability of these externally funded projects. He ended by saying that MetService's goal in PICTs is to see all NMSs in PICTs effectively managing and operating their own services, noting that MetService is always on stand by to offer advice and specialist assistance whenever is required.

5.2 Mr M. Bergin (Australia), in his presentation on "Building Public and Commercial Partnerships to Mitigate the Impacts of Tropical Cyclones", began by posing questions on "Why build partnerships?", "What makes successful partnerships?" and "How do we nurture partnerships?". Mr Bergin stressed that a good working relationship with national Governments has always been critical to building partnerships. Also, communicating tropical cyclone warnings clearly to the public is essential. It is also essential to develop effective partnerships through active participation in Emergency Managers' (EMs) Committee and State Mitigation Committee meetings, tropical cyclone seasons' campaigns with EMs, meetings with key people with public profiles, and weekly briefings to EMs during tropical cyclone seasons. These were evident during tropical cyclone "George" in March 2007 after a "forecast failure", Australian BoM still managed to maintain a "good warning" service, with all stakeholders' full understanding and support. He concluded that partnership is the way to do business and one must pro-actively engage and seek out partners, nurture them through frequent liaison, and never to be complacent, as they could disappear.

5.3 Mr D. Aranug (Federated States of Micronesia) in his presentation identified a number of issues in building partnerships with stakeholders. Firstly, it has always been a challenge to provide weather forecasts in the Federated States of Micronesia (FSM) that is situated in the vast Pacific Ocean. With respect to the Pacific Wave 2008 Exercise in October 2008, FSM has identified various areas of weaknesses, especially with the lack of warning sirens, over reliance and poor coverage of high frequency (HF) radio telecommunications systems using solar power, many of which are switched off at night. He underlined the need for experts to conduct bathymetric mapping of the FSM Economic Exclusive Zone (EEZ).

5.4 The Conference recognized that it is essential to build and nurture successful partnerships with the national Governments, end-users of weather, climate and water information including tropical cyclone and tsunami warnings. The Conference made the following conclusions and recommendations:

- (a) All NMHSs in PICTs must be able to effectively manage and operate their own services, rather than heavily depend on external assistance;
- (b) Building strong relationships or partnerships between NMHSs, national Governments and all other stakeholders is critical to the success of any warning systems; and
- (c) Urgent technical support to FSM Weather Services is required to improve its capability to ensure the effective dissemination of timely forecasts, watches and warnings.

## **6. HUMAN RESOURCES DEVELOPMENT AND TRAINING OPPORTUNITIES (Topic 4)**

6.1 Mr N.A. Cruz (Philippines) stated that there is a need to improve human resources in the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA). This is needed to enhance the provision of weather and climate information to various sectors of the economy, including the public, aviation, marine and agriculture, as well as to provide timely and accurate warnings to mitigate and prevent disasters. PAGASA has put in place human resources development and training opportunities for its personnel in various related

meteorological fields, including weather forecasting, radar and satellites. They also had the opportunity to attend local and international scientific and technical seminars and courses as well as obtaining scholarships and fellowships to undertake undergraduate and postgraduate training programmes. The Government of Philippines has hosted and funded the WMO Regional Training Centre (RTC Philippines) for South-East Asia since 1978, however it is yet to implement the two new categories of meteorological personnel scheme as endorsed by WMO. It also has linkages with a number of countries in the Middle East, South and South-East Asia as well as PICTs. RTC Philippines has produced 244 graduates during the period 1970-2007.

6.2 Dr E. Aldrian (Indonesia) stressed that human resources development and training are very important to downscale regional and global meteorological and climatological products generated from global numerical models for local scale phenomena, such as localized severe thunderstorm for disaster risk management. Information on local scale weather and climate phenomena would enable NMHSs to enhance their services as well as communicating accurate information to the users and decision-makers. BMKG has conducted various activities in this area such as in-house training, organization of international workshops and enabling personnel to study at postgraduate level in Indonesia and other countries.

6.3 Ms R. Pulehetoa (Niue) informed the Conference that although the Niue Meteorological Service continues to face various constraints, it has continued to strive to deliver weather and climate information efficiently to the people of Niue and to fulfil Niue's regional and international commitments. Some of these constraints included the non-existence of qualified meteorologists, forecasters and ICT personnel. It also has very limited rainfall and synoptic stations. The Niue Meteorological Service has continued to enhance its capacity development through international collaboration and support and hopes to have at least one qualified meteorologist and a qualified aviation forecaster in the near future.

6.4 Mr D. Hiriasia (Solomon Islands) emphasized that there is an urgent need to enhance the human resources of the Solomon Islands Meteorological Service. One of the major constraints the Service has faced is to recruit personnel with tertiary qualifications in mathematics and physics or equivalents, a basic requirement for the next level of training to be a meteorologist and a weather forecaster. The Meteorological Service has taken actions to request additional training budget allocation from the national Government as well as to liaise with the Ministry of Education for Government's scholarship to support its staff to undertake tertiary studies in the fields of mathematics and physics at the University of the South Pacific (USP). It has also tried to attract university graduates with mathematics and physics degrees to join the Service. Mr Hiriasia concluded by requesting WMO to consider upgrading assistant weather forecasters, an equivalent of former WMO Class II, to a level of meteorologist and/or certified aviation forecaster.

6.5 Mr M. Vaiimene (Cook Islands) informed the Conference that although the employees of Cook Islands Meteorological Service are enthusiastic, loyal and computer literate as well as having good customer skills, there is still a need to motivate them to improve their meteorological and climatological knowledge so as to be able to respond to user requirements effectively and efficiently. There is also a need to find innovative ways to build capacity and capabilities of the human resources. The Service has endeavoured to identify further training opportunities such as professional expertise attachments with more advanced NMHSs, attending WMO training programmes and undertaking tertiary studies at a postgraduate level for its personnel. However, it has continued to face some constraints such as budget constraints and trained and skilled personnel leaving the Service.

6.6 The Conference, noting that it is very important for NMHSs to strengthen their human resources capacity in all areas related to weather, climate and water, agreed on the need:

- (a) For Members of RA V to be innovative, to enhance their human resources capacity through recruiting tertiary qualified personnel in the fields of mathematics and physics and other related areas, establishing training facilities if necessary, and allocating adequate financial resources for training;

- (b) To strengthen regional and international financial collaboration and technical support to enhance the human resources development of LDCs' Members; and
- (c) To request WMO to provide support for upgrading assistant forecasters, an equivalent of former WMO Class II, to meteorologist level and/or to aviation forecaster level.

## **7. EMERGING TECHNOLOGY INCLUDING INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) (Topic 5)**

7.1 Mr E.H. Young, Jr. (USA) informed the Technical Conference that the USA NOAA/NWS has continued to work with global partners in setting meteorological standards and coordinating data and information networks to strengthen the ability of NMHSs to save life and protect loss of property. One of its global missions is to work with WMO and partners to maximize available ICT resources within some WMO Regions to support NMHSs in SIDS. It also works with regional organizations to ensure interoperability of these systems to maximize the benefit that ICT could bring to SIDS, such as continuing support for EMWIN broadcasts on NOAA geostationary satellites. Mr Young stressed that there is an urgent need to collaborate closely with regional and global partners to take advantage of existing and expanding ICT facilities within SIDS, especially with emerging, low-cost technologies, such as the expansion of broadband capability and the increase of affordable L, C and Ku band satellite coverage, as well as ensuring their ability to be sustained locally. The ultimate goal is to garner support from ICT providers to make sure that ICT resources can meet the need of all users of NMHSs and increase collection and dissemination of observations, meanwhile improving the effectiveness, distribution, and availability of early warning systems to the remote areas of SIDS.

7.2 Mr K.C. Low (Malaysia) informed the Conference that the development of an ICT system in MMD is aligned to the Top-level Objectives of the WMO Strategic Plan - to improve forecasts and enhance delivery of information and services and Malaysian Government policy of e-Government - to enhance the public delivery system through the provision of integrated and efficient ICT solutions to ensure easier and speedier access to Government services, especially by the rural communities. MMD has set up a robust and comprehensive automatic monitoring and ICT systems, including data and information communication, processing and archiving system as well as forecasting and early warning information delivery and dissemination systems. The MMD ICT system is in the process of being upgraded. MMD has also enhanced its numerical weather prediction products, marine, climate and tsunami prediction systems so as to improve its multi-hazard early warning system.

7.3 Dr Fauzi (Indonesia) stated that since the devastating tsunami occurrence of 26 December 2004, Indonesia, in line with the other affected countries, has enhanced its early warning system for earthquake and tsunami. This has enhanced its cooperation with the neighboring countries on the exchange of data and information that finally lead to the setting up of the regional Indian Ocean Tsunami Warning System (IOTWS). With the enhanced monitoring and ICT facility, Indonesia is now capable to make a decision on the possibility of tsunami occurrence within 5 minutes of an earthquake occurrence and to send out the warning information immediately. Since 2007 BMKG had issued 21 tsunami warnings, all of which were within 10 minutes of the earthquake events, however there are still constraints to avoid false alarms: only 5 out of 21 warnings predicted correctly a tsunami. BMKG has developed a Disaster Support System for tsunami warning that supports the integration of additional components as well as enhancing the process of analyzing and updating tsunami threat, and 5 in 1 application software to enhance the use of the RANET network to disseminate earthquake information and tsunami warning to the remote areas.

7.4 Mr J. Mala (Vanuatu) informed the Technical Conference that the Vanuatu Meteorological Service for many years has been facing problems in disseminating weather and climate information, including warnings, due to the geographical isolation of the islands, limited telecommunication coverage that only caters for urban areas and sub-centers, and the high cost

of maintenance for telecommunication facilities. Some of these constraints have been overcome with new development in the telecommunication sector in Vanuatu. The Government of Vanuatu has recently replaced the monopolistic policy with an open market policy in the telecommunication industry as well as establishing a Universal Access Policy (UAP) in 2007 to reduce cost and improve telecommunication coverage to the last mile throughout Vanuatu. These have resulted in an improved dissemination of meteorological information and warning. Vanuatu is also currently in the process of installing an e-Government network.

7.5 The Technical Conference recognized some of the constraints in telecommunication services and facilities in Region V which are also leading to the limitation of disseminating weather and climate information including warnings to the communities, and made the following conclusions and recommendations:

- (a) There is a critical need to enhance ICT facilities in SIDS. However, there are constraints for these countries to set up and sustain the required facility. Thus there is a need for international and regional coordinated financial and technical support to address ICT opportunities and advances in SIDS;
- (b) There is a need to integrate as well as to ensure interoperability and compatibility of ICT and early warning monitoring systems, so that data and information can reach NMHSs, and warning information can reach the targeted local people, especially those in remote areas;
- (c) Developing countries, in particular LDCs and SIDS should take advantage of any opportunities to share existing ICT systems through partnership and collaboration; and
- (d) The sustainability of existing ICT systems, such as RANET and EMWIN, should be ensured in view of the tangible benefits delivered by these systems to developing countries, including LDCs and SIDS.

## **8. QUALITY MANAGEMENT PRACTICES (Topic 6)**

8.1 Mr S. Sillayo (WMO) presented the status of the implementation of a Quality Management System (QMS) Demonstration Project currently being undertaken in Tanzania Meteorological Agency (TMA). Desirable steps for a successful implementation of QMS in PICTs or elsewhere as learnt from the project were presented and discussed. Documentation and templates developed in the demonstration project could be readily shared with all Members of WMO. An estimate of the costs involved and the possible funding options for aspiring NMHSs were also presented and discussed. Bilateral and/or regional groupings were seen as a viable option. It was noted that the forthcoming upgrade of QMS would not make a certification mandatory immediately. NMHS could choose to implement *ISO 9004:2000* that is based on the same principles as *ISO 9001:2008*. Mr Sillayo also provided guidance on the application of QMS and described its processes. It has been specifically developed to assist organizations in establishing and improving their QMS but it is not intended for third party certification. It has, however, provided a self-assessment tool that would provide fact-based guidance to the organization on where to invest resources for improvement in its performance. By using bilateral or regional groupings, Members can form a small team of Inspectors (*e.g.*, one from each Member) to perform annual audits in the countries and produce a report that the Permanent Representatives can use to continually review, and where appropriate, improve the processes in their QMS.

8.2 Mr 'Ofa Fanu'nu (Tonga) started his presentation with a briefing on the development of Tonga Meteorological Service's new logo that emphasizes the main function of the Meteorological Service - to provide first hand meteorological and coastal warnings for Tonga. The second part of the presentation covered a QMS model to meet ICAO requirements for services to international navigation, in particular a model that small NMHSs could use. He emphasized that there is no universal solution or model; a QMS must be designed for each

NMHS individually; a QMS must be based on a policy decision; constant collaboration is needed with local Government, WMO, ICAO and partners; and the cost recovery should be considered to finance a QMS.

8.3 Mr A. Waqicelua (Fiji) informed the Technical Conference of the status of implementing a QMS in Fiji Meteorological Service (FMS) for aviation services. The information included costs and benefits of a QMS. The costs would include a QMS Manager, other staff time and external auditing. The initial costs would depend on the size and structure of an organization and number of sites and could be considered as costs of doing business. As a QMS is embedded into the daily operation, staff time would gradually be reduced and benefits could outweigh the costs. Other benefits would include providing FMS with a culture of quality, performance information and assurance to stakeholders, improving efficiency, and retaining customers. The implementation of Quality Assurance (QA) in FMS started in 1999. A Steering Committee has provided the oversight with the assistance of a consultant from the MetService New Zealand Limited. A QA Manager has been identified to work with the consultant and later would oversee QA and be the custodian of the on-line QA documents. In early 2009 QA documents were reviewed and a consultant would be hired to provide guidance on the implementation of QMS in FMS for international navigation.

8.4 The Conference noted the discussions on this topic and made the following conclusions and recommendations:

- (a) More information about QMS should be provided by WMO and ICAO to Members of RA V to assist them with the implementation of QMS in their NMHSs by 2010;
- (b) Members of RA V should be urged to consider designating a full-time QMS Manager to ensure smooth implementation of QMS in their respective NMHSs;
- (c) Members of RA V who are under the responsibility of RSMC Nadi should be encouraged to continue to assist by providing METAR reports, in order to produce TAFs;
- (d) Members of RA V should be encouraged to ensure that QMS is in compliance with regular requirements of Civil Aviation Authorities (CAA), ICAO, ISO and WMO;
- (e) Documentation including templates and the quality manual developed during the Tanzanian Demonstration Project should be used as examples in other Members of WMO in pursuit of implementing QMS in their NMHSs for aviation services; and
- (f) Members of RA V in particular LDCs and SIDS in the Pacific region should be urged to group together to mobilize resources and implement QMS in their NMHSs, and a similar arrangement could be made for cost recovery.

## **9. DISASTER RISK REDUCTION (Topic 7)**

9.1 Mr K. Shida (WMO) outlined the WMO Disaster Risk Reduction (DRR) programme. He noted that WMO has continued to leverage global, regional and national cooperation with national development to ensure the development and availability of technical capacities at the national level. He informed the Conference that the adoption of the Hyogo Framework for Action (HFA) in 2005 has led to a new paradigm in disaster risk management based on preparedness and preventions through risk assessment, risk reduction and risk transfer. He introduced the WMO approach to assist its Members in strengthening their early warning systems through relevant projects, the second Multi-Hazard Early Warning Symposium in May 2009, and the Third World Climate Conference (WCC-3) from 31 August to 4 September 2009.

9.2 Mr Shida also delivered a case study presentation on Tropical Cyclone "Nargis" which hit Myanmar in May 2008 and caused serious damage to the country. He briefed the Conference on the warnings and information issued by the Department of Meteorology and Hydrology (DMH)

of Myanmar and actions taken by Government authorities, the United Nations, and civil societies, and lessons learned which would be useful for RA V Members to enhance their capacity and capability in DRR. He also introduced the actions taken by WMO including press releases, press conferences, WMO missions to Myanmar and assistance for rebuilding DMH which was underway.

9.3 Mr A.K. Nayani (UNISDR) introduced the HFA and its strategic goals and priorities for action. He also introduced the main functions of the ISDR Secretariat and emphasized the contribution that partnerships like the Global Platform and the Regional Platforms on DRR for Asia and Pacific were making towards promoting the HFA. He highlighted outcomes of the major conferences, particularly those of the Asian Ministerial Conferences on Disaster Risk Reduction and the designating of the UNISDR Asia Pacific Partnership (IAP) as the operational arm of the AMCDRR (New Delhi, 2007) and moving towards action-orientated decisions (Kuala Lumpur, 2008) and preparing a Regional Action Plan by the Asia and Pacific Regional Office of the UNISDR in collaboration with members of the IAP on the Kuala Lumpur Declaration on DRR as well as earlier declarations in Delhi and Beijing, and to report on its progress at the Fourth AMCDRR (Inchon, 2010) and also to call on donors to support the preparation process and implementation of the Action Plan. Mr Nayani also highlighted the assistance and support provided by UNISDR to the Sub-Regional Platforms such as ASEAN, SAARC, ECO, SOPAC, APEC, etc. towards promoting the HFA Five Priorities of Actions, namely, (i) Ensure DRR is a priority with a strong institutional basis for action, (ii) Identify, assess and monitor disaster risks and enhance early warning, (iii) Use knowledge, innovation, education for culture of safety and resilience, (iv) Reduce the underlying risk factors, and (v) Strengthen disaster preparedness for effective response. He concluded his presentation by mentioning the challenges still ahead of us.

9.4 Mr M. Bergin (Australia) provided a report on the outcomes of the twelfth session of RA V Tropical Cyclone Committee for the South Pacific and South-East Indian Ocean (Niue, July 2008), works being undertaken to develop a proposal for a Severe Weather Forecast and Disaster Risk Reduction Demonstration Project (SWFDDP) for RA V and recommendations from the RA V Storm Surge Watch Scheme Action Team Meeting (Melbourne, Australia, December 2008). The Conference acknowledged the excellent work being undertaken on a proposed SWFDDP for RA V and urged WMO to allocate resources for the implementation of the project. The Conference noted the recommendations of the Storm Surge Watch Scheme Action Team meeting and urged the Executive Council to consider those recommendations at its forthcoming session in June 2009.

9.5 Mr G. Foley (Australia) presented an overview of the meteorological conditions prior to, and during the Australia bushfires in February 2009. The fire event was the worst fire disaster in Australian history resulting in 170 losses of life. In concluding, Mr Foley highlighted the effectiveness on the Australian BoM operation prior to, during and after the fire event.

9.6 Ms C.G. Ismail (Malaysia) briefed the Conference on natural hazards including the statistics that have affected Malaysia. Ms Ismail highlighted the needs and important elements in early warning systems, and preparedness and response capability in Malaysia. Weather-related hazards included floods, strong wind and rough sea, thunderstorms and lightning, tropical storms and typhoons, forest fires and haze, and agricultural droughts; and geophysical hazards included earthquakes, local and regional tsunamis, and landslides: disastrous events affecting the lives of hundreds of thousands of people and causing damage to billions of dollars worth of assets and properties. Therefore, there is a need for an end-to-end early warning system and one of its objectives would be to empower individuals and communities threatened by disastrous hazards to act in sufficient time and in an appropriate manner so as to reduce the possibility of personal injury, loss of life, damage to property and the environment, and loss of livelihoods.

9.7 Mr A. Waqicelua (Fiji) informed the Conference on the development and advancement of, and challenges facing the capability and sustainability of a warning system for tropical cyclone in the Pacific region. As the advancement of science and technology continues to improve the

warning system, the demand for warnings continues to increase as more people are moving to higher risk areas, more demand is coming from weather sensitive sectors, and the policies of governments are changing. With respect to the Regional Specialized Meteorological Centre Nadi - Tropical Cyclone Centre (RSMC Nadi) has faced a lot of challenges such as high staff turnover, diminishing knowledge and skill base, decreasing budgetary provisions, and the need for higher investments on personnel and training; improved reporting networks; heightened public awareness; and increased government attention to disaster risk management. To address these challenges, RSMC Nadi is considering training at least five personnel to the level of meteorologist per year, the pooling of meteorologists, and embarking on commercialization activities.

9.8 Mr T. Gabi (Papua New Guinea) focused his presentation on the National Weather Service (NWS) involvement in disaster risk management. Given the broad range of disaster events affecting Papua New Guinea, NWS has only recently, since 1997, been involved in disaster risk management. The role of NWS in disaster risk management could be categorized into three main areas, namely: early warning for adaptation and mitigation of drought impacts, early warning for mitigation of impacts purposes, and dissemination of warnings of tectonic hazards such as tsunami and volcanic eruptions. NWS has a collaborative arrangement with the agriculture sector in particular the National Agriculture Research Industry (NARI) in terms of providing early warning to farmers in rural areas. The strategy is aimed at sustaining food supplies by switching to alternative crop species (one that matures earlier) such as sweet potato, cassava, dry land rice and banana.

9.9 Mr L. Talia (Samoa) introduced the early warning system in Samoa and the national proposal for the JICA Grant Aid. The proposal would be linked to the National Adaptation Programme for Action (NAPA) to support an early warning system for agriculture, water and health sectors.

9.10 The Conference, taking the above into consideration, agreed on the need:

- (a) To urge WMO to allocate resources for the implementation of the proposed SWFDDP project, and urge the Executive Council to consider at its forthcoming session in June 2009 the recommendations of the Storm Surge Watch Scheme Action Team meeting;
- (b) To define multi-hazard disasters, since some NMHSs also deal with geophysical phenomena such as tsunamis;
- (c) For WMO to provide guidance and collect best practices on DRR partnerships that are successful in downscaling DRR to the local level, so that warning information and evacuation strategies reflect the best advice by local officials to the local population;
- (d) For WMO, Members of RA V and their NMHSs to strengthen DRR partnerships to extend to the development sectors, and to climate adaptation planning;
- (e) To synchronize the WMO RA V Tropical Cyclone Committee (TCC) for the South Pacific and South-East Indian Oceans Technical Plan to the revised draft RA V Strategic Plan. This would allow the expected outcomes and benefits of the TCC Technical Plan to be included in the draft RA V Strategic Plan;
- (f) To closely review the frequency of the occurrence of extreme weather events, to improve disaster risk reduction and mitigation efforts, and help improve warning messages, in particular for locations where the time period between extreme hazard events is long;
- (g) To strengthen DRR partnerships, in particular the outreach and education aspects of warnings and evacuations related to fires;
- (h) To expand traditional DRR activities to civil societies and NGOs, including religious organizations and communities;

- (i) To assist Members of RA V reliant on regional centres such as RSMC Nadi, to move faster towards self-sufficiency in issuing tropical cyclone forecasts and warnings at the national level; and
- (j) To address the sustainability challenges faced by RSMC Nadi.

## **10. CLIMATE PREDICTION AND INFORMATION FOR DECISION-MAKING (Topic 8)**

10.1 Mr R. Yamada (Japan), as an invited lecturer, introduced a framework proposed by WMO for advanced climate service as well as a process for the establishment of RCC network in RA II. He expressed his expectation that the RCC in RA II would be formally designated by the Executive Council during its sixtieth session in June 2009. Mr Yamada presented the operational activities for long-range forecast and climate monitoring produced by the Tokyo Climate Centre (TCC) operated by the Japan Meteorological Agency (JMA) in accordance with RCC's four mandatory functions. Finally, as one of JMA's initiatives for the WCC-3, Mr Yamada informed the Conference that the Tokyo Climate Conference would take place in Tokyo, Japan in July 2009, and would bring together experts on climate services from NMHSs and specialists in user sectors from Asia-Pacific countries with the aim of identifying actions and methods to develop an effective framework involving users and providers to create user-oriented products and promote their utilization.

10.2 Dr E. Aldrian (Indonesia) delivered a detailed presentation on the planned World Climate Conference (WCC-3) - "Better climate information for a better future." WCC-3 is aiming at establishing a global framework to guide the development of climate services and to facilitate efforts to reduce the risks and realize the benefits associated with current and future climate conditions. Dr Aldrian highlighted challenges and rationale for a global climate service framework and stressed that Members of WMO could contribute in a variety of ways via presentations, at roundtable discussions and through information highlighting regional disparities.

10.3 Mr H.V. Tan (Malaysia) informed the Conference that there are 38 principal and 149 climatological stations in Malaysia. Rainfall rather than temperature is the most important climate parameter for clients in Malaysia. MMD produce monthly climate reports and 3-month outlook on rainfall for their Ministry, a monthly agroclimate analysis and a 40-day outlook, a 6-month Climate Outlook and El Niño Outlook, a seasonal forecast for Northeast and Southwest monsoons and also for the Inter-monsoonal periods. MMD clients include the national Government, private industry and water authorities. He indicated some constraints on the development of these products and stressed the need for WMO to help ensure Members' free access to meteorological data and products from global centres such as the European Centre for Medium-Range Weather Forecasts (ECMWF) and enhance capacity development to improve the capability to upgrade their climate prediction and information systems. He concluded by stating that increased cooperation to address common issues and enhanced international collaboration among all NMHSs in the region are definitely required in order to meet the environmental challenges of the 21st century.

10.4 Dr E. Aldrian (Indonesia) informed the Conference that a new Climate Division has recently been created in BMKG to provide climate services to the country. The products would include forecasts of the onset of the Northwest monsoon, monthly rainfall predictions (3 months ahead), monthly predictions of water availability, forecasts of the onset of the dry season, and detailed predictions of date of planting for various crops. He further introduced the adaptation option/strategy, underlying policy framework and key constraints and opportunities for water, agriculture, infrastructure, health, tourism, transport and energy sectors.

10.5 The Conference noted the discussions and identified the following recommendations:

- (a) WMO should assist Members in organizing an inter-regional meeting, e.g., Tokyo

Climate Conference planned for July 2009, to bring together TCC/BCC and Members of RA V for sharing experiences; and facilitate the participation of RA V Members in the planned WCC-3;

- (b) WMO should facilitate establishment of RCCs in RA V, in view of the experiences in development and operation of TCC and BCC, through the RA V Working Group on Climate-related Matters.

## **11. CLOSURE OF THE CONFERENCE**

11.1 The Conference reviewed and adopted the draft Report.

11.2 The participants, the vice-president of Regional Association V and the representative of WMO expressed their thanks and appreciation to the Government of Malaysia and the Ministry of Science, Technology and Innovation for the successful hosting of the Conference. They also expressed gratitude to Dr Yap and his staff for the warm hospitality and excellent arrangements made.

11.3 The Conference closed at 12:35 hours on 24 April 2009.

**FIFTH TECHNICAL CONFERENCE ON MANAGEMENT OF METEOROLOGICAL AND  
HYDROLOGICAL SERVICES IN REGIONAL ASSOCIATION V (SOUTH-WEST PACIFIC)**

**“STRATEGIC CAPACITY DEVELOPMENT OF NMHSs IN RA V”**

**(Kuala Lumpur, 20 to 24 April 2009)**

**LIST OF PARTICIPANTS**

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**FIFTH TECHNICAL CONFERENCE ON MANAGEMENT OF METEOROLOGICAL AND  
HYDROLOGICAL SERVICES IN RA V (SOUTH-WEST PACIFIC)  
“Strategic Capacity Development of NMHSs in RA V”**

(Kuala Lumpur, Malaysia, 20 to 24 April 2009)

**PROGRAMME**

**Monday, 20 April 2009**

Morning

- 09:00 –** Registration at the Malaysian Meteorological Department
- 11:00 – 12:00 Informal Meeting of the Task Team on RA V Strategic Plan
- 12:00 – 14:00 *Lunch Break*

Afternoon

**14:30 – 15:40 OPENING CEREMONY**

*Dr Yap Kok Seng (PR of Malaysia with WMO);  
Dr Tokiyoshi Toya (Representative of the Secretary-General of WMO);  
Dr Sri Woro B. Harijono (vice-president, RA V);  
Y.Bhg. Datin Paduka Prof. Dr Khatijah Mohd Yusoff (Deputy Secretary-  
General, Ministry of Science, Technology and Innovation, Malaysia)*

*- Group Photo -*

- 15:40 – 16:00 *Refreshment*
- 16:00 – 16:20 Introduction to the Technical Conference and Working Arrangements  
*Dr T. TOYA (WMO)*

**Topic 1: STRATEGIC PLANNING AND MANAGEMENT OF NMHSs**

***Chair: Dr YAP Kok Seng (Malaysia)  
Rapporteur: Mr P. LEFALE (New Zealand)***

- 16:20 – 16:50 WMO Strategic Plan and Regional Strategic Planning: Experience from RA II  
Strategic Planning  
*Dr T. TOYA (WMO)*
- 16:50 – 17:10 Strategic Planning and Management of Malaysian Meteorological  
Department  
*Mr T.S. KANG (Malaysia)*
- 17:10 – 17:30 Indonesia Meteorological Service (BMKG) Strategy in linking up National  
and International Policies on Climate Change  
*Dr Sri Woro B. HARIJONO (Indonesia)*

17:30 – 17:50 Kiribati Meteorological Report and Strategy Plan  
*Mr T. KIREUA (Kiribati)*

**Tuesday, 21 April 2009**

Morning

**Topic 1: STRATEGIC PLANNING AND MANAGEMENT OF NMHSs  
(Continued)**

**Chair: Dr YAP Kok Seng (Malaysia)**

**Rapporteur: Mr P. LEFALE (New Zealand)**

**09:00 – 09:30** Introduction to the Draft RA V Strategic Plan and its Action Plan  
*Mr G. FOLEY (Chairperson of the Task Team on RA V Strategic Plan)*

**09:30 – 10:30** Review and Discussions on the draft Strategic Plan and Action Plan

**10:30 – 10:50** *Coffee Break*

**10:50 – 12:30** Review and Discussions on the draft Strategic Plan and Action Plan  
*(Continued)*

**12:30 – 14:00** *Lunch Break*

Afternoon

**Topic 2: SOCIO-ECONOMIC BENEFITS OF WEATHER, CLIMATE AND  
WATER SERVICES**

**Chair: Dr Sri Woro B. HARIJONO (Indonesia)**

**Rapporteur: Mr N. A. CRUZ (Philippines)**

**14:00 – 14:20** WMO Activities on Socio-economic Benefits of Weather, Climate and Water Services  
*Dr B.-C. CHOI (WMO)*

**14:20 – 14:40** Outcomes of and Follow-up on the WMO Coordination and Capacity Building Workshop for Least Developed Countries (LDCs) in Asia-Pacific, Port Vila, Vanuatu (6-10 October 2008)  
*Mr H. TAIKI (WMO)*

**14:40 – 15:00** Discussion and recommendations on Topic 2

**Topic 3: BUILDING PARTNERSHIP WITH STAKEHOLDERS AND  
PUBLIC RELATIONSHIPS**

**Chair: Dr Sri Woro B. HARIJONO (Indonesia)**

**Rapporteur: Mr A. WAQAICELUA (Fiji)**

**15:00 – 15:20** Enhancing Meteorological Services in the Pacific Islands – New Zealand Experience  
*Mr P. LEFALE (New Zealand)*

**15:20 – 15:40** *Coffee Break*

**15:40 – 16:00** Building Public and Commercial Partnerships to Mitigate Impacts of Tropical Cyclones  
*Mr M. BERGIN (Chairperson of RA V TCC)*

- 16:00 – 16:20 Building Partnership and Public Relationship – Federated States of Micronesia Experiences  
*Mr D. ARANUG (Federated States of Micronesia)*
- 16:20 – 17:00 Discussion and recommendations on Topic 3

**Wednesday, 22 April 2009**

Morning

**Topic 4: HUMAN RESOURCES DEVELOPMENT AND TRAINING OPPORTUNITIES**

**Chair: Mr 'O. FA'ANUNU (Tonga)**

**Rapporteur: Mr T. S. KANG (Malaysia)**

- 09:00 – 09:30** Human Resources Development and Training Opportunities including WMO Regional Training Centre (RTC) in the Philippines  
*Mr N.A. CRUZ (Philippines)*
- 09:30 – 09:50** Human Resources Development and Training in Indonesia Meteorological Service (BMKG)  
*Dr E. ALDRIAN (Indonesia)*
- 09:50– 10:10** Human Resources Development and Training Opportunities in Niue Meteorological Service  
*Ms R. PULEHETOA (Niue)*
- 10:10 – 10:40** *Coffee Break*
- 10:40 – 11:00** Human Resources Development and Training Opportunities – Solomon Islands Experiences  
*Mr D. HIRIASIA (Solomon Islands)*
- 11:00 – 11:20** Human Resources Development and Training Opportunities in Cook Islands  
*Mr M. VAIMENE (Cook islands)*
- 11:20 – 12:00** Discussion and recommendations on Topic 4
- 12:00 – 14:00** *Lunch Break*

Afternoon

**Topic 5: EMERGING TECHNOLOGY INCLUDING INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)**

**Chair: Mr G. FOLEY (Australia)**

**Rapporteur: Ms C.G. ISMAIL (Malaysia)**

- 14:00 – 14:20** Integrating ICT Advances to Support Small Islands Meteorological Services  
*Mr E. YOUNG (USA)*
- 14:20 – 14:40** The Usage of ICT in Malaysian Meteorological Department's Multi-Hazard Early Warning System  
*Mr K.C. LOW (Malaysia)*
- 14:40 – 15:00** Development of RANET Network and Decision Support System to Determine Earthquake and Tsunami Warnings to Remote Rural Community  
*Dr FAUZI (Indonesia)*
- 15:00 – 15:20** ICT Requirements for Dissemination of Meteorological Information including Warnings in Vanuatu  
*Mr J. MALA (Vanuatu)*
- 15:20 – 15:50** Discussion and recommendations on Topic 5
- 15:50 – 16:10** *Coffee Break*

**Topic 6: QUALITY MANAGEMENT PRACTICES**

**Chair: Mr G. FOLEY (Australia)**

**Rapporteur: Ms R. PULEHETOA (Niue)**

- 16:10 – 16:40** Implementation of ISO 9001:2008 Quality Management System for the Provision of Meteorological Services to International Air Navigation in NMHSs  
*Mr S. SILLAYO (WMO)*
- 16:40 – 17:00** A Quality Management System for a Small NMHS – Tonga Experiences  
*Mr 'O. FA'ANUNU (Tonga)*
- 17:00 – 17:20** Implementation of Quality Management System for Aviation Services in Fiji  
*Mr A. WAQAICELUA (Fiji)*
- 17:20 – 17:50** Discussion and recommendations on Topic 6

**Thursday, 23 April 2009**

Morning

**Topic 7: DISASTER RISK REDUCTION**

**Chair: Mr D. ARANUG (Federated States of Micronesia)**

**Rapporteur: Mr E. YOUNG (USA)**

- 09:00 – 09:30** WMO Disaster Risk Reduction (DRR) Activities for RA V  
*Mr K. SHIDA (WMO)*
- 09:30 – 10:00** ISDR Regional DRR Programme  
*Mr A.K. Nayani (UN-ISDR)*
- 10:40 – 10:20** Report on the 12<sup>th</sup> session of RA V TCC Including Storm Surge Scheme Action Team and Severe Weather Demonstration Project in RA V  
*Mr M. BERGIN (Chairperson of RA V TCC and Storm Surge Scheme Action Team in RA V)*
- 10:20 – 10:40** Australia Bushfires 2008  
*Mr G. FOLEY (Australia)*
- 10:40 – 11:00** Coffee Break
- 11:00 – 11:20** Enhanced Preparedness and Early Warning in Disaster Risk Reduction  
*Ms C.G. ISMAIL (Malaysia)*
- 11:20 – 11:40** Tropical Cyclone Warning Systems in the South-West Pacific and Challenges in this New Era  
*Mr A. WAQAICELUA (Fiji)*
- 11:40 – 12:00** Strategy for Disaster Risk Reduction in Papua New Guinea  
*Mr T. GABI (Papua New Guinea)*
- 12:00 – 12:20** Early Warning System in Samoa  
*Mr T. LAMEKO (Samoa)*
- 12:20 – 13:00** Discussion and recommendations on Topic 7
- 13:00 – 14:00** Lunch Break

**Topic 8: CLIMATE PREDICTION AND INFORMATION FOR DECISION-MAKING**

**Chair: Mr T. KIREUA (Kiribati)**

**Rapporteur: Mr M. BERGIN (Australia)**

Afternoon

- 14:00 – 14:30** Climate Information Services in WMO GPC-RCC-NMHS Framework – Experience in RA II  
*Mr R. YAMADA (Japan)*
- 14:30 – 14:50** World Climate Conference (WCC)-3  
*Dr E. ALDRIAN (Indonesia)*

- 14:50 – 15:10 Climate Prediction and Information for Decision-Making in Malaysia  
*Mr H. V TAN (Malaysia)*
- 15:10 – 15:30 Climate Prediction and Information for Water, Agriculture and Energy Sectors in Indonesia  
*Dr E. ALDRIAN (Indonesia)*
- 15:30 – 16:00 Discussion and recommendations on Topic 8
- 16:00 – 16:20 *Coffee Break*
- Topic 1: STRATEGIC PLANNING AND MANAGEMENT OF NMHSs  
(Continued)**
- Chair: Dr YAP Kok Seng (Malaysia)**  
**Rapporteur: Mr P. LEFALE (New Zealand)**
- 16:20 – 17:30 Review of the final draft of the RA V Strategic Plan and Action Plan

**Friday, 24 April 2009**

Morning

- 09:00 – 10:30 *Technical Visit to the Malaysian Meteorological Department*
- 10:30 – 12:00 Review and Adoption of the Report and  
*Closure of Technical Conference*
- 12:30 – 14:00 *Lunch Break*

Afternoon

**EXTRAORDINARY SESSION OF RA V MANAGEMENT GROUP**

**Chair: Dr Sri Woro B. HARIJONO (Vice-president)**  
**Rapporteur: H. TAIKI (WMO)**

- 14:00 – 17:30 Preparation for XV-RA V session
- Concept
  - Agenda and Documentation
  - Work Plan
  - RA V Strategic Plan
  - New Working Structure of the Association
  - Other issues including logistics
-