WORLD METEOROLOGICAL ORGANIZATION
AND
ECONOMIC AND SOCIAL COMMISSION
FOR ASIA AND THE PACIFIC

FOR PARTICIPANTS ONLY

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Typhoon Committee
Forty-Second session
Singapore
25 to 29 January 2010

ENGLISH ONLY

COORDINATION WITH OTHER ACTIVITIES OF THE WMO TROPICAL CYCLONE PROGRAMME

(Item 7 of the Provisional Agenda)

Note by the WMO Secretariat

INTRODUCTION

This document provides information on activities carried out under the WMO Tropical Cyclone Programme (TCP) during the inter-sessional period after the 41st session to assist the Committee in its consideration of coordination within the TCP (see Annex I).

ACTION PROPOSED

The Committee is invited to:

(a) Review the activities carried out within the TCP since the Forty-first session of the Typhoon Committee (Chiang Mai, Thailand, 19 to 24 January 2009) and the proposals for the future, which are indicated in Annex I to this document or otherwise reported to the session;

(b) Consider what further measures, if any, may be taken to strengthen coordination between its own activities and those conducted under other parts of the TCP.

(c) Comment on the summary of the outcome of the "Typhoon Operational Forecasting Training at the RSMC Tokyo – Typhoon Centre" as given in Annex 2

Annex 1: Activity Rreport on the Implementation of the WMO Tropical Cyclone Programme (31 December 2009)

Annex 2: Summary of the outcome of the "Typhoon Operational Forecasting Training at the RSMC Tokyo – Typhoon Centre" (Tokyo, Japan, 22 – 31 July 2009)

Activity Report on the Implementation of the WMO Tropical Cyclone Programme

(31 December 2009)

1. Introduction

1.1 The WMO Tropical Cyclone Programme carries out its activities in accordance with Congress resolutions and Executive Council decisions, implementing activities to achieve the Expected Results of the WMO Strategic Plan. The resolutions and decisions with particular relevance to the programme are highlighted in the following sections,

1.2 The WMO Executive Council at its sixty-first session (EC-LXI, Geneva, June 2008) discussed implementation of the Tropical Cyclone Programme and provided guidance under the Expected Results 1, 6 and 9 of the WMO Strategic Plan.

1.3 With reference to advances in operational weather forecasts and warnings, EC-LXI reaffirmed the use of ensemble techniques including multi-model consensus forecasting by the national and regional tropical cyclone warning centres to further improve the application of NWP to tropical cyclone forecasting. It also underlined the dissemination of ensemble-based probabilistic guidance to improve the representation of forecast uncertainty which will be especially useful for disaster risk management in threatened areas. In this regard, the Council noted with satisfaction that the Technical Forum for EPS and the operational system for data processing and display was held in the Republic of Korea for the forecasters of Typhoon Committee members in May 2009. The Council recognized that such training workshops facilitate the use of ensemble-based products in forecaster- and user-friendly forms through a systematic and optimized approach. The Council therefore requested the Secretary-General to give high priority to the organization of such workshops in other regions for the best use of those products.

1.4 With respect to improving forecast of tropical cyclones and their impacts, the Council noted that the working environment of tropical cyclone forecasters has been changing rapidly in many NMHSs with increased availability of data from new observational systems as well as forecast products, including EPS from major NWP centres. In the meantime, demands are increasing in diverse user communities for the tropical cyclone warning service that could be more compliant to their disaster risk management activities. Given those circumstances, the Council recognized the need to enhance support measures for the forecasters to optimize the efficiency of warning services and develop operational strategies to meet the growing demands from the users. Accordingly, the Council requested the Secretary-General to revise and update the Global Guide to Tropical Cyclone Forecasting as early as possible with due consideration for the newly emerging requirements. It also underlined that the new Global Guide be linked to the Tropical Cyclone Forecaster's website which will allow the operational forecasters for easier access to the up-to-date tools and reference materials for monitoring and forecasting of tropical cyclone track and intensity.

1.5 Improvements of operational tropical cyclone forecasting and warning should be based on advances in research and technical developments on tropical cyclones. In this connection, the Council recognized that, while tropical cyclone forecasts have attained increasing accuracies in the track forecasting, they still rely heavily on the research and technology developments for improvement of forecasting tropical cyclone intensities, associated heavy rainfall and storm surge, as well as seasonal frequency of tropical cyclones. The Council therefore reiterated that high priority be continuously given to transferring from R&D into operational use aspects of forecasting of rapid changes of track and intensity of tropical cyclones and the impact of associated hazards during tropical cyclone landfall due to its significance for disaster prevention. To focus R&D activities and facilitate the transfer to operations, the Council encouraged active interaction between operational forecasters and researchers as a key to success. Noting that the research

workshops and projects organized by TCP and WWRP provide excellent opportunities in this regard, the Council urged the Secretary-General to take necessary actions to promote the involvement of operational forecasters in those events particularly the Seventh International Workshop on Tropical Cyclones (IWTC) (November 2010) and the Second International Workshop on Tropical Cyclone Landfall Processes (Shanghai, China, 19 – 23 October 2009).

1.6 In reference to its request to the Secretary-General to facilitate in consultation with UNESCO-IOC the development of storm surge watch schemes (SSWS), the Council was pleased to note that through collaborative efforts of JCOMM and TCP, immediate actions were taken by the five TCP regional bodies to assist their Members by establishing regionally coordinated frameworks for enhancing their capabilities to access and understand existing wave and storm surge products worldwide, and to make use of them for operational forecast and warning services. The Council requested the Secretary-General: (i) to keep Members informed of the developments and to continue; (ii) to give high priority to these activities, including facilitating and supporting the regional associations concerned in the development of SSWS; and (iii) to continue capacity-building activities related to use of SSWS guidance information. The Council urged Members concerned to take appropriate actions to improve storm surge and wave forecast and warning services within their areas of responsibility.

1.7 In recognition of the impacts of the TCP/JCOMM training workshop series on storm surge and wave forecasting, the Council requested the Secretary-General to continue to support such training workshops in the future.

1.8 With regard to the capacity building, the Council recognized that the developing countries, especially Small Island Developing States (SIDS) and the Least Developed Countries (LDCs) are increasingly more vulnerable to tropical cyclone impacts due to lack of human resources and a high degree of economic vulnerability. The Council reaffirmed the need for sustainable training efforts especially for SIDS and LDCs to allow them to achieve skills and competencies required for effective operational tropical cyclone forecasting and warnings for minimizing tropical cyclone disaster risks. In this regard, the Council noted that the continuing collaboration between the Tropical Cyclone Programme (TCP) and the Public Weather Services Programme has proved its effectiveness in integrated training of tropical cyclone forecasters in Regions I, II, IV and V. The Council also underlined the importance of the transfer of practical techniques to the forecasters through the attachment trainings at TC RSMCs. The Council requested the Secretariat to include forecasters from all affected regions in future training of this nature.

2. Activities of TCP in 2009

2.1 During the inter-sessional period (January to December 2009), the following events were organized or co-sponsored under the Programme:

- ESCAP/WMO Typhoon Committee, 41st session (Chiang Mai, Thailand; 19 – 24 January 2009);

- Tropical Cyclone Operational Forecasting Training at RSMC New Delhi – Tropical Cyclone Centre (New Delhi, India, 9 to 20 February 2009);

- WMO/ESCAP Panel on Tropical Cyclones High Policy Working Group, the First Meeting (Muscat, Oman; 27 – 28 February 2009);

- WMO/ESCAP Panel on Tropical Cyclones, 36th session (Muscat, Oman; 2 – 6 March 2009);

- The First International Conference on Indian Ocean Tropical Cyclones and Climate Change (Muscat, Oman; 8 – 11 March 2009);

- RA IV Workshop on Hurricane Forecasting and Warning and Public Weather Services (Miami, USA; 23 March to 3 April, 2009);

- RA IV Hurricane Committee 31st session (Nassau, Bahamas, 20 – 24 April 2009);

- The First ESCAR/WMO Typhoon Committee TRCG Technical Forum on EPS, Probabilistic Forecast and TIPS (Jeju Island, Republic of Korea; 12 – 15 May 2009);

- Attachment of Typhoon Forecasters from China and Malaysia for Typhoon Operational Forecasting Training at RSMC Tokyo-Typhoon Center (Tokyo, Japan; 22 to 31 July 2009);

- The ESCAP/WMO Typhoon Committee Integrated Workshop on Building Sustainability and Resilience in High Risk Area of the Typhoon Committee: Assessment and Action (Cebu, Philippines; 14 – 18 September 2009);

- The Eighth Southern Hemisphere Training Course on Tropical Cyclones (Melbourne, Australia; 29 September – 9 October 2009);

- Storm Surge Attachment Training at IIT (Delhi, Inida; 28 September – 10 October 2009);

- The 2nd International Workshop on Tropical Cyclone Landfall Processes (Shanghai, China; 19 – 23 October 2009);

- The Sixth Tropical Cyclone RSMCs/TCWCs Technical Coordination Meeting (Brisbane, Australia; 2 – 6 November 2009);

- Attachment of two forecasters from Cook Islands and Samoa for the on-the-job training on operational analysis and forecasting of tropical cyclone at the RSMC Nadi Tropical Cyclone Centre (Fiji; 23 November – 4 December 2009);

- ESCAP/WMO Typhoon Committee Meeting of Chairs of Working Groups on Meteorology, Hydrology and Disaster Prevention area (Macao, China; 14 – 16 December 2009).

2.2 The TCP programme comprises two components: a general component concerned with collective issues such as methodology and transfer of technology, and a regional component devoted to the activities of five regional tropical cyclone bodies. The updated list of Members of these bodies is shown in **Appendix I**.

3. General component

3.1 The main activities in the year under review under the general component continued to be directed towards the publication of manuals and reports, which provide information and guidance to Members to assist them in the increased application of scientific knowledge and technology for the improvement of warning and disaster prevention and preparedness systems corresponding Expected Results I and VI on enhanced capabilities of forecasting and warning service delivery and disaster risk reduction. Under this component, attention was also given to the broader aspects of training under the TCP.

3.2 Priorities were given to capacity building to address the issue of sustainable development with emphases particularly on attachments of forecasters from developing countries at the different Regional Specialized Meteorological Centres (RSMCs) during the cyclone season and storm surge/wave experts at the Indian Institute of Technology in Kharagpur, India, a number of workshops and a joint training event in cooperation with the

Public Weather Service Programme, and a number of Working Group (Committee) sessions co-joint with Disaster Risk Reduction Programme. These activities are in accordance with the programme's objective to facilitate the transfer of knowledge and technology to improve the institutional efficiency of the NMHSs leading to the provision of better tropical cyclone track and intensity forecasts and associated flood and storm surge forecasts, and coordinated actions towards tropical cyclone disaster risk reduction.

3.3 The TCP home page within the WMO Web site http://www.wmo.int/pages/prog/www/tcp/index_en.html is continuously being updated. In addition, the TCP Forecaster's website has started to develop for purpose of technology transfer under changing environment.

3.4 WMO continued to be engaged in the services of Systems Engineering Australlia Pty Ltd (SEA) to undertake reviews and assessments that would lead to the recommendation of suitable conversion factors between the WMO 10-minute standard average wind and 1-minute, 2-minute and 3-minute "sustained" winds. The SEA submitted to the final report in January 2009, with one page executive summary for the final review at this meeting. This undertaking is trying to determine the conversion factors connecting the various wind averaging periods and its subsequent inclusion into the Global Guide to Tropical Cyclone Forecasting and the Operational Plans/Manual of the TC regional bodies.

3.5 Tropical cyclone news for the WMO news website http://www.wmo.int/pages/mediacentre/news/index_en.html will be continuously provided for facilitating media outreach.

3.6 The Global Guide to Tropical Cyclone Forecasting has been undertaking updating, and is expected to have the first reviewed version in April 2010. After completion, it will be posted to the TCP Forecaster's website for widespread access by forecasters and researchers around the globe.

3.7 The First International Conference on Indian Ocean Tropical Cyclones and Climate Change was held in Muscat, Oman, from 8 – 11 March 2009. It was attended by more than 50 international scientists from all over the globe.

3.8 The 2nd International Workshop on Tropical Cyclone Landfall Processes was held in Shanghai, China, 19 – 23 October 2009. It was attended by around 60 experts representing all the Regional Bodies of the Programme.

3.9 The Sixth Tropical Cyclone RSMCs/TCWCs Technical Coordination Meeting was held Brisbane, Australia; 2 – 6 November 2009. The Directors of RSMCs/TCWCs and invited experts from the Tropical Cyclone Regional Bodies attended the meeting.

4. Regional component

4.1 Many activities of the TCP were carried out under the regional component with a view to minimizing tropical cyclone disasters through close regional cooperation and coordination. Major emphasis was placed on improvement in the accuracy of the forecasts, provision of timely early warnings and on the establishment of necessary disaster preparedness measures. Each of the tropical cyclone bodies has in place a formally adopted tropical cyclone operational plan or manual, aimed at ensuring the most effective tropical cyclone forecasting and warning system with existing facilities, through cooperative agreement on sharing of responsibilities and on coordinated activities within the respective region. Each of these bodies was giving attention to the implementation of their technical plan for future development of services to meet regional needs for upgrading forecasting and warning facilities and services for tropical cyclones and associated floods and storm surges, as well as for related disaster risk reduction measures and supporting activities in training and research.

4.2 The detailed activities under the regional component may be described separately as below.

5. ESCAP/WMO Typhoon Committee

5.1 The Forty-first Session of the ESCAR/WMO Typhoon Committee was held in Chiang Mai, Thailand; 19 – 24 January 2009. It was attended by 102 participants from 12 out of 14 Members of the Typhoon Committee, namely: Cambodia; China; Hong Kong, China; Japan; Macao, China; Malaysia; Philippines; Republic of Korea; Singapore; Thailand; the Socialist Republic of Viet Nam; and the United States of America (USA) and 6 observers from the United Nations International Strategy for Disaster Reduction Secretariat (UN/ISDR), the Federal Service for Hydrometeorology and Environmental Monitoring (ROSHHYDROMET) of the Russian Federation, the United Nations Development Programme (UNDP), the Commission of Atmospheric Sciences of WMO (CAS/WMO), the Joint Typhoon Warning Center of USA and the International Civil Aviation Organization (ICAO). Representatives from the Economic and Social Commission for Asia and the Pacific (ESCAP), the World Meteorological Organization (WMO) and Typhoon Committee Secretariat (TCS) also attended the session. Decisions by the Committee at the session can be found in its final report which will be available in WMO/TCP website.

5.2 The First ESCAR/WMO Typhoon Committee TRCG Technical Forum on EPS, Probabilistic Forecast and TIPS was held in Jeju Island, Republic of Korea, 12 – 15 May 2009, under the co-sponsorship of the Committee, WMO and Republic of Korea.

5.3 The Japan Meteorological Agency (JMA) organized "Attachment Training" at the RSMC Tokyo-Typhoon Center from 22 – 31 July 2009 under the co-sponsorship of the Committee and WMO. The training was attended by two female forecasters from P. R. China and Malaysia.

5.4 The ESCAP/WMO Typhoon Committee Integrated Workshop on Building Sustainability and Resilience in High Risk Area of the Typhoon Committee: Assessment and Action was organized in Cebu, Philippines, 14 – 18 September 2009.

5.5 ESCAP/WMO Typhoon Committee Meeting of Chairs of Working Groups on Meteorology, Hydrology and Disaster Prevention area was held in Macao, China, 14 – 16 December 2009.

6. WMO/ESCAP Panel on Tropical Cyclones

6.1 The thirty-sixth session of the WMO/ESCAP Panel on Tropical Cyclones was held in Muscat, Oman from 2 to 6 March 2009. The session was attended by 54 participants from the eight Members of the Panel. Decisions by the WMO/ESCAP Panel on Tropical Cyclones at its 36th session can be found in its final report which is available in WMO/TCP website.

6.2 WMO/ESCAP Panel on Tropical Cyclones High Policy Working Group, the First Meeting (Muscat, Oman; 27 – 28 February 2009). in conjunction with the first meeting of the Panel's High Policy Working Group (27 - 28 February 2009).

6.3 Attachment of two forecasters from Bangladesh and Maldives was arranged by WMO and the RSMC New Delhi from 9 to 20 February 2009 for the on-the-job training at the RSMC on operational analysis and forecasting of tropical cyclone.

6.4 Also, attachment trainings for storm surge experts were organized in IIT under the co-sponsorship of WMO from 28 September – 10 October 2009 at the IIT Delhi in the implementation and running of a PC-based high-resolution storm surge model.

7. RA I Tropical Cyclone Committee (RA I/TCC) for the South-West Indian Ocean

7.1 The Eighth Southern Hemisphere Training Course on Tropical Cyclones was held in Melbourne, Australia, from 29 September to 9 October 2009. Four of the five selected participants from the region attended the workshop.

8. RA IV Hurricane Committee

8.1 The Government of the USA hosted an RA IV Workshop on Hurricane Forecasting and Warning, and Public Weather Services in Miami, 23 March to 3 April, 2009. It was organized by the NWS/NOAA Tropical Prediction Center/National Hurricane Center in cooperation with WMO (TCP Division and PWS Division). The workshop was conducted in English, and attended by 23 participants from twelve Members of RA IV and three Members of RA II. And the next is in preparation, and plan to be held in Miami, USA, from 15 - 26 March 2010.

8.2 The thirty-first session of the Hurricane Committee was held in Nassau, Bahamas, from 20 – 24 April 2009. The session was held back to back with the RA IV 15th session. It was attended by members of the RA IV Hurricane Committee and some regional and international organizations.

8.3 Decisions by the RA IV Hurricane Committee at its 30th session can be found in its final report which is available in WMO/TCP website.

9. RA V Tropical Cyclone Committee (RA V/TCC) for the South Pacific and South-East Indian Ocean

9.1 The Eighth Southern Hemisphere Training Course on Tropical Cyclones was held in Melbourne, Australia, from 29 September to 9 October 2009. Eight participants from the region attended the workshop.

9.2 Many other training events organized by Members, regional organizations and institutions, which can be found in the Attachment II of Appendix V of the final report of the 12th Session of the RA V Tropical Cyclone Committee, available at WMO/TCP website.

9.3 Attachment training of two forecasters from Cook Islands and Samoa was arranged by WMO and the RSMC Nadi Tropical Cyclone Centre from 23 November to 4 December 2009 for the on-the-job training at the RSMC Nadi on operational analysis and forecasting of tropical cyclone.

10. Cooperation with other organizations

10.1 In accordance with the wishes of the WMO Congress, and Executive Council, close cooperation with other international and regional organizations has strengthened. Thus, there has been close cooperation and collaboration with the Economic and Social Commission for Asia and the Pacific (ESCAP), the International Strategy for Disaster Reduction (ISDR) Secretariat, the Asian Disaster Reduction Center (ADRC), the International Federation of Red Cross and Red Crescent Societies (IFRC), the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM), SOPAC and SPREP and other organizations, on a variety of matters of common concern. The main items include ESCAP's co-sponsorship of the Typhoon Committee and the Panel on Tropical Cyclones, as well as the ISDR Secretariat and the ADRC's involvement in the disaster risk reduction component of the TCP, in particular in the context of the ISDR.

10.2 As part of the long-established close working relationship between WMO and the International Civil Aviation Organization (ICAO), a number of the TC RSMCs and Tropical Cyclone Warning Centres have also been designated as ICAO Tropical Cyclone Advisory

Centres (TCAC) by ICAO Regional Air Navigation Agreements. The centres, listed below, provide specialized tropical cyclone warning services for the aviation community:

RSMC/TCWC	Area of responsibility
Darwin (Australia)	South-eastern Indian Ocean, South-western Pacific Ocean
Honolulu (USA)	Central North Pacific
La Réunion (France)	South-western Indian Ocean
Miami (USA)	North Atlantic, Caribbean, Eastern North Pacific
Nadi (Fiji)	Southern Pacific
New Delhi (India)	Bay of Bengal and the Arabian Sea, i.e. N: Coastal line; S: 5N/10N; E:100E; W: 45E
Tokyo (Japan)	Western North Pacific, including the South China Sea

10.3 During the period from 2 to 31 March 2009, all the TCACs participated in a coordination session with World Area Forecast Centres (WAFCs), which was conducted four times a day via internet, in response to the request from the World Area Forecast System Operations Group (WAFSOPSG) of ICAO. This session was aimed to ensure that there is no discrepancy in tropical cyclone information between WAFS SIGWX forecasts and TCAC advisories. it was also expected to promote the collaborative relationship between WMO/TCP and ICAO/WAFS.

10.4 On a regional basis, WMO, through its Tropical Cyclone Programme, has fostered and maintained close collaboration and fruitful coordination with regional bodies concerned with disaster risk reduction issues, in particular with the Asian Disaster Preparedness Center (ADPC), the Asian Disaster Reduction Center (ADRC), the Caribbean Disaster Emergency Response Agency (CDERA), and the South Pacific Regional Environment Programme (SPREP), and UN-ISDR.

10.5 WMO is collaborating with JICA to organize a joint JICA-FMS workshop in FMS, Fiji, 1 – 5 February 2010. Ten Small Island States of the South Pacific will be benefited from the workshop.

11. Activities for 2010

11.1 The TCP covers a wide range of activities which are of a continuing and long-term nature. Preceding sections of this report contain an overview of several of the ongoing activities and, in some instances, indications have been given of the plans for the period ahead. The main parts of the 2010 programme are set out below in summary form:

General component

(a) Follow-up activities on the WMO Strategic Plan;

(b) Updating of the TCP home page within the WMO Web site, and developing the Tropical Cyclone Forecaster web site (TCP Sub-project No. 24) which will serve as a source for tropical cyclone forecasters to obtain forecasting and analytical tools and techniques for tropical cyclone development, motion, intensification, and wind distribution, and so on; Updating of the Tropical Cyclone Forecasting Website which

was launched in 2009, and designated to dedicate tropical cyclone forecasting techniques, methodologies and other related knowledge;

(c) Attachment of forecasters to all six TC RSMCs during the cyclone season;

(d) Continued support and coordination to update the Global Guide on Tropical Cyclone Forecasting in response to recommendation from the IWTCs. The Guide is due to be peer reviewed in April 2010;

(e) Coordination of the services and activities of six TC RSMCs (Miami, Tokyo, Honolulu, New Delhi, La Reunion and Nadi) and TCWCs (Darwin, Perth, Brisbane, Wellington, Port Moresby and Jakarta) with a view to improving regional services of the centers. Review of the global standards in forecasting techniques and warning services including those for data exchange and forecasts verification.

(f) Outreach to media and general public by posting tropical cyclone information to the WMO news website, and responding by email to inquiries related to tropical cyclones around the globe.

(g) Development and establishment of a Storm Surge Watch Scheme in each of the tropical cyclone regional bodies.

(h) Implementation of the Landfall Typhoon Forecast Demonstration Project in East China, which was recommended to establish during the WMO Second International Workshop on Tropical Cyclone Landfall Processes (IWTCLP-II) in Shanghai, China, 19 – 23 October 2009, and adopted at the 15th Session of the Commission for Atmospheric Sciences (CAS XV) in Incheon, Republic of Korea, 18 – 25 November 2009.

Regional component

11.2 Under the regional component, the programme will be mainly concerned with the activities undertaken by the five regional tropical cyclone bodies and the implementation of the decisions they make. A provisional schedule for the period from January to December 2010 of meetings and training events within or related to the TCP, is given below:

- ESCAP/WMO Typhoon Committee, 42nd session (Singapore; 25 - 29 January 2010).

- WMO/ESCAP Panel on Tropical Cyclones, 37th session (Phuket, Thailand; 15 – 19 February 2010).

- RA IV Hurricane Committee 32nd session (Bermuda, UK; 8 – 12 March 2010).

- RA V Tropical Cyclone Committee 13th session (Bali, Indonesia; 16 – 29 April 2010).

- RA I Tropical Cyclone Committee 19th session (dates and place to be determined).

- RA IV Workshop on Hurricane Forecasting and Warning, and Public Weather Services (Miami, USA; 15 – 26 March 2010).

- The 7th International Workshop on Tropical Cyclones (La Reunion, France; November 2010).

- RA I Training Course on Tropical Cyclones (La Reunion, France; November 2010).

- Storm Surge Workshop for RA IV Hurricane Committee Members (dates and place to be determined).

- Training Workshop on Wave and Storm Surge Forecasting in RA II (dates and place to be determined).

- Forecaster Attachment Trainings in RSMC New Delhi, RSMC Nadi, RSMC Tokyo and Indian Institute of Technology Delhi (Dates to be determined).

11.3 Important inter-sessional activities will include:

- As appropriate, preparation, editing, updating, publication and distribution of new editions or supplements to the Tropical Cyclone Operational Plans for the Bay of Bengal and Arabian Sea (English only), the South-West Indian Ocean (English and French), the South Pacific and the South-East Indian Ocean (English and French), the Hurricane Committee Region (English and Spanish) and the Operational Manual for the Typhoon Committee Area (English only);

- Distribution of updated technical plans for further development of the Regional Cooperation Programmes of the five regional tropical cyclone bodies;

- Publication and distribution of the “GUIDELINES FOR CONVERTING BETWEEN VARIOUS WIND AVERAGING PERIODS IN TROPICAL CYCLONE CONDITIONS” that was adopted at the Sixth Tropical Cyclone RSMCs/TCWCs Technical Coordination Meeting was held in Brisbane, Australia, 2 – 6 November 2009.

- Publication in hardcopy with limited quantity and in web format with free access of the “Global Guide to Tropical Cyclone Forecasting.”

11.4 In more general terms:

- Activities for the implementation of of the Tropical Cyclone Programme section of the WMO Strategic Plan;

- Implementation of activities within the framework of the International Strategy for Disaster Reduction (ISDR);

- Continued activities for the implementation of the Regional Cooperation Programmes, Technical Plans and other work programmes of the regional tropical cyclone bodies;

- Work of study groups, sub-groups and rapporteurs established by the regional tropical cyclone bodies, e.g. training and research activities in the meteorological component of the Typhoon Committee's programme under the leadership of the Coordinator, typhoon Training and Research Coordinating Group (TRCG), and the rapporteur on updating of the Typhoon Committee Operational Manual, the Working Group on the Panel on Tropical Cyclones Coordinated Technical Plan, the implementation of satellite based telecommunications regional networks, and on regional activities on storm surges

- action on further proposals made by the Fifteenth WMO Congress, the Executive Council, the Regional Associations concerned and the regional tropical cyclone bodies.

Appendix 1

TCP REGIONAL BODIES

ESCAP/WMO TYPHOON COMMITTEE	WMO/ESCAP PANEL ON TROPICAL CYCLONES	RA I TROPICAL CYCLONE COMMITTEE FOR THE S.W. INDIAN OCEAN	RA IV HURRICANE COMMITTEE	RA V TROPICAL CYCLONE COMMITTEE FOR THE S. PACIFIC AND S.E. INDIAN OCEAN
(14 Members)	**(8 Members)**	**(15 Members)**	**(26 Members)**	**(17 Members)**
CAMBODIA	BANGLADESH	BOTSWANA	ANTIGUA & BARBUDA	AUSTRALIA
CHINA	INDIA[@]	COMOROS	BAHAMAS	COOK ISLANDS
DEM. PEOPLE'S REP. OF KOREA	MALDIVES	FRANCE[@]	BARBADOS	FIJI[@]
HONG KONG, CHINA*	MYANMAR	KENYA	BELIZE	FRENCH POLYNESIA*
JAPAN[@]	OMAN	LESOTHO	BRITISH CARIBBEAN TERRITORIES*	INDONESIA
LAO PDR	PAKISTAN	MADAGASCAR	CANADA	KIRIBATI
MACAO, CHINA*	SRI LANKA	MALAWI	COLOMBIA	MICRONESIA
MALAYSIA	THAILAND	MAURITIUS	COSTA RICA	NEW CALEDONIA*
PHILIPPINES		MOZAMBIQUE	CUBA	NEW ZEALAND
REPUBLIC OF KOREA		NAMIBIA	DOMINICA	NIUE
SINGAPORE		REP. OF SOUTH AFRICA	DOMINICAN REPUBLIC	PAPUA NEW GUINEA
THAILAND		SEYCHELLES	EL SALVADOR	SAMOA
USA		SWAZILAND	FRANCE	SOLOMON ISLANDS
VIET NAM, SOCIALIST REPUBLIC OF		UNITED REPUBLIC OF TANZANIA	GUATEMALA	TONGA
		ZIMBABWE	HAITI	UNITED KINGDOM
			HONDURAS	USA[#]
			JAMAICA	VANUATU
			MEXICO	
			NETH. ANTILLES AND ARUBA*	
			NICARAGUA	**Non-Members of WMO (6):**
			PANAMA	
			ST. LUCIA	- EAST TIMOR
			TRINIDAD AND TOBAGO	- MARSHALL ISLANDS
			UK	- NAURU
			USA[@]	- PALAU
			VENEZUELA	- TOKELAU
				- TUVALU
[@]RSMC Tokyo - Typhoon Center	[@] RSMC-Tropical Cyclones-New Delhi	[@] RSMC La Réunion - Tropical Cyclone Centre	[@] RSMC Miami - Hurricane Center	[@] RSMC Nadi - Tropical Cyclone Centre [#] RSMC Honolulu - Hurricane Center

* Member Territories

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

SUMMARY OF PARTICIPANT EVALUATION FORM

The training was attended by two participants from P. R. China and Malaysia. The summary is based on evaluations of the participants.

Ninth Typhoon Operational Forecasting Training at RSMC Tokyo - Typhoon Center

(Tokyo, Japan, 22 – 31 July 2009)

Part A: The Overall Evaluation

Please tick the boxes to indicate *how well your expectations of the training were met*	Below expectation	Met expectation	Exceeded expectation
General items to be evaluated:	☹	😐	☺
1. Course objectives		1	1
2. Course content		1	1
3. Course format		1	1
4. Overall standard of instruction		1	1
5. Training materials (handouts, visual aids)			2
6. Course administration		1	1
7. Training facilities (classroom, PCs, etc)		1	1
8. Travel arrangements		1	1
9. Language (interpretation, translation, etc)		1	1

Part B: Evaluation of Sessions and Instructors

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Please indicate how well your expectations of the Sessions' Content and Presentation were met	Below expectation	Met expectation	Exceeded expectation
Nr. & Title of the Session; Name of the Instructor	☹	😐	☺
1. Introduction to RSMC Tokyo Kiichi SASAKI		1	1
2. GMSLPD (SATAID viewer) and Cloud Analysis Yoshiro TANAKA		1	1
3. Early Stage Dvorak Analysis (EDA) Kenji KISHIMOTO		1	1
4. Dvorak Analysis Yoshiro TANAKA		1	1
5. Tropical Cyclone Forecast Kenji KISHIMOTO		1	1
6. Tropical Cyclone Analysis Kenji KISHIMOTO		1	1
7. Tropical Weather Discussion Kenji KISHIMOTO		1	1

Part C: Possible Follow-ups

1. Please describe in one sentence the benefits you received from this course.

I learn Dvorak theory and Dvorak analysis. after coming back my office ,I use Dvorak analysis for forecast, such as **TS Goni, TY Morakot and STS Etau .**

This course has improved my skills in Tropical Cyclone analysis and forecast.

2. What new ideas, new skills or attitudes do you intend to implement back in your office?

After returning my office, I use Dvorak analysis for forecast ,such as TS Goni, TY Morakot and STS Etau. I discuss and interchange Dvorak analysis with my colleague.

Analyzing and forecasting Tropical Cyclone by using the Dvorak method.

3. For the items ranked “below expectation” under the previous Parts A and B, please give brief reasons.

None.

4. What recommendations would you have to improve this course?

More exercise/practical in Dvorak method should be given to the trainees.

Specific section in the post-event Report

The post-event Report will contain a core, three-parts, section summing-up the trainees' evaluations and suggestions. Obviously, the Report will also contain other relevant sections, including *Introduction*, *Recommended Actions by WMO*, and an *Annex* listing all participants and their complete address.

Summary of the Overall Evaluation

Based on all students' input at the end of the Course	☹ Number	😐 of	☺ Hits
1. Course objectives			
2. Course content			
3. Course format			
4. The overall standard of instruction			
5. Training materials			
6. Course administration			
7. Training facilities			
8. Travel arrangements			
9. Language, interpretation, translation			
Total	S_{below}	S_{metE}	S_{above}

By allocating the weights *4, 7, 10* to the replies with *below*-, *met*-, *above*-expectations, respectively, a weighted-average "Event Mark" in the range 4 to 10, will be derived:

Event Mark = **(***4* x S_{below} + *7* x S_{metE} + *10* x S_{above}) / (S_{below} + S_{metE} + S_{above})

Summary of the course Sessions & Instructors Evaluation

Based on all students' input at the end of the Course *Title of the session and name of instructor*	*Content* *Presentation*	☹ Number	😐 of	☺ Hits
1. Introduction	*Content* *Presentation*			
2.	*Content* *Presentation*			
3.	*Content* *Presentation*			
4.	*Content* *Presentation*			
5.	*Content* *Presentation*			
6.	*Content* *Presentation*			
7.	*Content* *Presentation*			
8.	*Content* *Presentation*			
9.	*Content* *Presentation*			
10.	*Content* *Presentation*			
Total	*Content*	S_{below}	S_{metE}	S_{above}
Total	*Presentation*	S_{below}	S_{metE}	S_{above}

III. Trainees Comments and Suggestions

1. Trainees benefits
2. New ideas, skills and attitudes
3. Drawbacks to be corrected
4. Recommendations

Annex 2

Summary of the Evaluation

Based on the in-session evaluations by the 2 trainees at the RSMC Tokyo – Typhoon Centre for typhoon operational forecasting training, the assessment may be briefly summarized as follows:

1. In Part A, Overall evaluations of the training are marked as all “Exceeding Expectation” and “Meeting Expectation.” In particular, both the trainees evaluated the Training Materials as “Exceeding Expectation.”

   The training courses and instructors in Part B are evaluated same as the above, i.e. both participants marked as “Exceeding Expectation” and “Meeting Expectation”.

2. Achievements: the trainees concluded that the course had improved the skills and capability in Tropical Cyclone analysis and forecast and made them have learnt Dvorak theory and Dvorak analysis, which are very useful in tropical cyclone analysis and forecast after they return back to their countries.

3. Further actions by the participants in their own countries after the training are as follows:

   - Apply the Dvorak method into tropical cyclone analysis and forecast.

   - Discuss and exchange with colleagues on use of Dvorak method and techniques in tropical cyclone analysis and forecast.

4. Recommendations for improvement of the serial training attachments in future.

   More exercises and practices in Dvorak method should be given to the trainees.

In summary, the training attachment was evaluated as being very satisfactory with all items/sessions ranked as “Exceeding Expectation” and “Meeting Expectation”. It did and will improve knowledge of understanding and skills, thus increase confidence of the trainees, in analyzing and forecasting tropical cyclones in their home countries and sharing knowledge learned from the training with their staff colleagues. It is a very efficient and effective way to assist Typhoon Committee members to enhance their capabilities to produce better typhoon forecasts and warnings such that typhoon related disaster risks can be reduced to a minimum. It is therefore recommended that such training attachment activities which are in high demand of the Committee members should be continued.