XXIV Session of the EC Panel of Experts on Education and Training; Boulder, Colorado, USA, 22-26 March 2010

WORLD METEOROLOGICAL ORGANIZATION

EXECUTIVE COUNCIL
PANEL OF EXPERTS ON EDUCATION AND TRAINING

TWENTY-FOURTH SESSION

BOULDER, COLORADO, USA

22 - 26 MARCH 2010

FINAL REPORT WITH RECOMMENDATIONS
WMO General Regulations

Regulation 42
Recommendations of working groups shall have no status within the Organization until they have been approved by the responsible constituent body. In the case of joint working groups the recommendations must be concurred with by the presidents of the constituent bodies concerned before being submitted to the designated constituent body.

Regulation 43
In the case of a recommendation made by a working group between sessions of the responsible constituent body, either in a session of a working group or by correspondence, the president of the body may, as an exceptional measure, approve the recommendation of behalf of the constituent body when the matter is, in his opinion, urgent and does not appear to imply new obligations for Members. He may then submit this recommendation for adoption by the Executive Council or to the President of the Organization for action in accordance with Regulation 9(5).
Executive Summary

The twenty fourth session of the WMO Executive Council Panel of Experts on Education and Training (the Panel) was held in Boulder, Colorado, USA from 22 to 26 March 2010.

The Panel addressed a number of topical and difficult issues including the preparation for the replacement of the 4th edition of WMO Publication 258, the review of external assessment reports for six WMO Regional Training Centres (RTCs), an assessment of proposals for new RTCs, reports on the outcomes from the two Task Teams created at the last Session of the Panel, the WMO Fellowship Programme, School and Popular Education, the WMO Education and Training Symposium and plans for 2010 and 2012 to 2015 education and training activities. The Panel complimented the work of the Education and Training Office and noted their pleasant surprise at the quality and quantity of work and issues handled by the Office given the small number of staff.

The Panel have recommended changes to: the draft key outcomes and key performance criteria for the Education and Training Programme (Agenda item 2); reviewed the Panel’s Terms of Reference (Agenda Item 3); made recommendations to EC regarding the definition of a WMO Meteorologist and the content and structure for the replacement publication to the 4th edition of WMO Publication No 258 (agenda item 4.1); recommended changes to the EC Criteria for the recognition and reconfirmation of WMO RTCs, recommended EC reconfirm the RTCs of Argentina, Barbados, Costa Rica, and Kenya, recommended EC delay the reconfirmation of Egypt and Madagascar as RTCs until they meet the corrective measures noted in the external assessment reports; made suggestions to improve the RTC external assessment reports; recommended the maintenance of the Task Team on Distance and Online Learning; supported the proposal for creating a small number of fellowships in high priority areas;, expressed strong support for the work of GLOBE in the School and Popular Education arena; and, expressed strong concern regarding the proposed budget support for the next financial period.

These decisions are expected to assist Members through:

- Providing better monitoring and focus for the ETRP
- Sound, clearer guidance on the education and training of new personnel, especially aeronautical meteorological personnel
- Increased publicity and exposure for School and Popular Education.
- More effective network of Regional Training Centres
- Promotion and application of distance learning.
- Promotion of the quality of national training programmes
Figure 1. Members of the Twenty-fourth Session of the Executive Council Panel of Experts on Education and Training


Front row: (L – R) A.I. Bedritskiy (Chair), K.-J. Park, I. Lisk, N. Alegre, M. Wang, C. Webster, J. Wellens Mensah, C. Garcia-Legaz, V. Castro

Unable to attend Session: Prof A. Salcedo, Mr A. Lagha
# TABLE OF CONTENTS

## 1 ORGANISATION OF THE SESSION

1.1 Opening of the Session ........................................................................................................... 7
1.2 Adoption of the Agenda ........................................................................................................... 9
1.3 Programme of Work ................................................................................................................. 9

## 2 MAJOR OUTCOMES OF EXECUTIVE COUNCIL (EC-LXI AND EC-LXII) AND REGIONAL ASSOCIATIONS

2.1 Update On The Status Of Strategic And Operational Plans From An Education And Training Perspective ........................................................................................................ 9

## 3 EXCHANGE OF VIEWS ON THE GOALS AND OBJECTIVES OF THE WMO EDUCATION AND TRAINING PROGRAMME (ETRP)

3.1 Panel Terms of Reference ......................................................................................................... 10

## 4 IDENTIFICATION OF WMO HUMAN RESOURCE DEVELOPMENT REQUIREMENTS

4.1 Preparations for the follow on to the 4th edition of WMO Publication No. 258 .................. 11
4.2 Preparations for the status report on WMO members training requirements, opportunities and capabilities in meteorology and hydrology ........................................... 14
4.3 Regional Training Centres (RTCs) ......................................................................................... 15

The Panel updated the schedule for assessments of RTCs for the period 2010 to 2012 (Annex VII – RTC External Assessment Programme) ................................................................................. 19

4.4 Report of the Chair of the Task Team on Aviation Forecaster Qualifications (TT-AEQ) 19
4.5 Report of the Chair of the Task Team on Distance and Online Learning (TT-DOL) 20
4.6 The WMO Fellowship Programme ......................................................................................... 21
4.7 School and Popular Education including GLOBE ................................................................. 23

## 5 ETRP TRAINING ACTIVITIES

5.1 Eleventh WMO education and training symposium (SYMEX XI) ........................................ 25
5.2 Proposed Training events for 2010 ......................................................................................... 26
5.3 Proposed Training Activities For 2012 To 2015 .................................................................. 26
5.4 Aeronautical Meteorological Personnel Competence Assessment Framework .............. 27

## 6 IDENTIFICATION OF GAPS BETWEEN DEVELOPMENT REQUIREMENTS AND CURRENT PLANS AND OPTIONS TO REDUCE THE GAPS

## 7 REPORT ON THE EDUCATION AND TRAINING OFFICE

Status Report on the WMO Education and Training Office ......................................................... 28

Next Meeting .............................................................................................................................. 31

APPROVAL OF THE DRAFT REPORT ...................................................................................... 31

CLOSURE OF THE SESSION .................................................................................................. 31

Annex I - REVISED AGENDA ................................................................................................. 32

Annex II - LIST OF PARTICIPANTS ......................................................................................... 33

Annex III – DRAFT RESOLUTION FOR EC – LXII .................................................................. 36
Annex IV–EC Criteria for the recognition and reconfirmation of Regional Training Centres.................................................................................................................................38

Annex V - Processing steps for Reconfirmation of RTCs .................................................................41

Annex VI - DRAFT RECOMMENDATION 4/1 (PAN-XXIV) - RECONFIRMATION OF RTCs ASSESSED DURING 2008 -2009 .................................................................................................................................42

Annex VII – RTC External Assessment Programme .........................................................................43

Annex VIII- Current WMO RTCs ..................................................................................................44

Annex IX ETR Symposium ..............................................................................................................45

Annex X - Actions from the XXIVth EC Panel of Experts on Education and Training Session.................................................................................................................................46
GENERAL SUMMARY OF THE WORK OF THE SESSION

1 ORGANISATION OF THE SESSION

1.1 Opening of the Session

The twenty-fourth session of the Executive Council Panel of Experts on Education and Training (PAN-XXIV) was held in Boulder, Colorado, USA from 22 to 26 March 2010. In opening the session, Dr A.I. Bedritskiy, the President of WMO and Chair of the Panel, thanked Dr J. Hayes, Permanent Representative of USA with WMO, for offering to host this session.

Dr Alexander MacDonald, Head of the NOAA Earth System Laboratory, addressed the Session on behalf of Dr Hayes who was unable to participate in the opening session. Dr MacDonald welcomed the Panel to the USA, in particular to the NOAA, UCAR and COMET facilities in Boulder. He noted that 2010 was the fiftieth anniversary of UCAR, the 20th anniversary of COMET and the 60th anniversary of WMO. WMO Day is also this week and it was particularly fitting that the Panel would be visiting the NOAA Laboratories on WMO Day to see the Earth System Simulator. The US National Weather Service is part of NOAA and soon NOAA will also have a Climate Service. Part of the Climate Service role will be to better inform policy makers and the general public of the challenges caused by the anthropogenic changes in the atmosphere.

Dr Jack Fellows, Vice President of UCAR, briefed the Panel on the role of UCAR in atmospheric research and education and training. UCAR is now comprised of more than 75 American universities who have weather and or climate research or education and training programs. Education and training has been a key part of UCAR’s program over the last 50 years and in October 2010 UCAR will be hosting a workshop examining the education and training for tomorrows’ workforce leaders. UCAR is particularly proud of the COMET Program and it is fitting that COMET were acting as the local hosts for this Panel Session.

In responding to the opening comments by Dr MacDonald and Dr Fellows, Dr Bedritskiy thanked NOAA, UCAR and COMET for the excellent local arrangements and preparations for the session. The Chair commented that it is crucial for members of the Panel to seize this occasion to review the WMO training requirements particularly in developing and least developed countries where often, full advantage of the developments in science and technology cannot be taken due to insufficient skilled human resource. This review should give particular attention on how to:

- Continually assess and address National Meteorological and Hydrological Services (NMHSs) training needs, including professional training and development, technical training, project development and management training;
- Develop effective assistance to NMHSs to address specific issues such as forecaster qualifications and competencies for aviation meteorology;
- Meet the other capacity development needs of NMHSs in developing countries, Least Developed Countries and Small Islands Developing States;
- Assist in the broadening of governmental, school and public education in Member countries to create a more environmentally literate populace;
• Improve regional cooperation and coordination between Regional Associations, Technical Commissions and the Secretariat for setting regional priorities in order to serve Members more efficiently;

The Chair observed that many WMO RTCs are currently facing challenges including the recruitment and training of instructors, enrolment of foreign students, the improvement of facilities and, topically, the enhanced education and training needs for aeronautical meteorological personnel. These challenges will be exacerbated in the coming years as the RTCs will be expected to contribute to capacity building activities in areas such as Disaster Risk Reduction, the Global Framework for Climate Services and improvements in the development and implementation of observation and communication networks and systems. While the WMO has continued to strive to have these centres be truly regional, they often lack the required input on their programs and plans and this often reduces their regional efficacy. Given the indispensable role of the RTCs in the WMO ETRP, it is now an opportune and timely moment to review the difficulties being faced by the RTCs, and make recommendations for policies and the direction to be followed in the future.

To assist us in planning, implementing, monitoring and evaluating our work the Chair observed that the ETRP will be working within the WMO Results Based Management framework. The next Strategic Plan has the ETRP in one Key Outcome area under Expected Result 6. The monitoring of the Key Outcomes through Key Performance Indicators will tell us whether we are achieving the Expected Results and evaluation of the Expected Results will lead to an assessment of whether we are on track to our Strategic Thrusts. Thus the discussion of Key Outcomes and Key Performance Indicators for the ETRP by the Panel is very timely. Dr Bedritskiy finished his introductory remarks noting the Panel members were leaders in meteorological and hydrological education and training and he looked forward to harnessing their knowledge, creativity and passion in the work of the Panel over the next four years.

Dr Timothy Spangler, Director of the COMET Program, provided the Panel with a brief overview of the COMET program over the last 20 years and the status of their current work. The COMET Program has a staff of 42 including meteorologists, instructional designers, graphic designers, ICT personnel and administrative support. The annual budget is around USD$ 6.5 million most of which comes from US major partners such as the NWS, NESDIS as well as the Air Force and the Navy. A small but significant portion comes from international sources such as the Meteorological Service of Canada and the Bureau of Meteorology in Australia. Currently COMET has approximately 600 hours of online course material available to the international community covering many of the WMO high priority areas. The WMO plays an important role in distributing COMET resources to countries with little or no internet connection. COMET has recently partnered with WMO to run an international virtual course in general hydrology for applicants who did not get selected for a 2008 face-to-face course run by the NWS in the COMET classroom. The feedback from this course was very positive. Thirty one people enrolled for the course with 24 completing the course.

Mr Jeff Wilson, Director of the WMO Education and Training Office, provided the Panel with an overview of the agenda and key issues. He thanked Panel Members for their work over the last two years with the two task teams, general assistance to the ETR Office and in producing documents for this session of the Panel. Mr Wilson acknowledged the friendly and
helpful assistance that the staff from COMET had provided to the ETR Office in the preparation for this session.

1.2 Adoption of the Agenda

The provisional agenda was adopted by the session with some amendments, and is reproduced in Annex I - REVISED AGENDA.

1.3 Programme of Work

The Chair proposed to the Panel that the working hours would be from 08:30 up to 12:30 and from 14:00 up to 17:00, with the usual half-hour coffee breaks at 10:00 and 15:30. The Panel would review the papers prepared for the Session in plenary and then create working groups to consider the major issues in detail before reconvening in plenary for final discussions.

2 MAJOR OUTCOMES OF EXECUTIVE COUNCIL (EC-LXI AND EC-LXII) AND REGIONAL ASSOCIATIONS

2.1 Update On The Status Of Strategic And Operational Plans From An Education And Training Perspective

In reviewing extracts of the draft WMO Strategic Plan for the 2012 to 2015 period, the Panel noted the evolution from the current Strategic Plan and the following important but subtle differences: the number of Expected Results (ERs) has decreased from eleven to eight; there is still an Expected Result covering Capacity Building; due to a subtle change in wording, the Expected Result unifies the reporting process for the Education and Training Programme (ETRP); under the current Strategic Plan, the ETRP is split across ER 7 and ER 9, in the new plan the ETRP will be consolidated into the one ER,

Whilst this ER (Enhanced capabilities of NMHSs, in particular in developing and least developed countries, to fulfill their mandates.) focuses solely on NMHSs, not Members, from a Panel perspective it is a distinct improvement on the current Expected Results.

Under the new Expected Result, the Panel noted that the ETRP has its own key outcome and recommended it be reworded as:
KO 6.3: Education and Training Development activities at national and regional levels are improved, especially in developing and least developed countries.

Noting the WMO priority areas for the next financial period, the Panel recommended that Key Performance Indicators be developed in three areas. Following extensive discussion, the Panel recommended the following three KPI’s, the first one focusing on the GFCS and the second on the fellowship component of the Capacity Building priority as it accounts for approximately half of the ETRP funds, and the third on the RTCs support to meet training demands.
The Panel recommended the following Key Performance Indicators

- The number of RTCs providing education and training support for GFCS related activities
- The degree to which Members are getting value for money\(^1\) from the WMO Fellowship Programme.
- The degree to which the RTCs support the regional training demands in particular for students from developing and least developed countries

The Panel voiced its concern about the lack of opportunity to have input into the KOs and KPIs at an earlier stage. It requested the Chair of the Panel to provide the EC WG on Strategic and Operational Plans with the feedback from the Panel at its next session in the week of 29 March to 1 April 2010.

3 EXCHANGE OF VIEWS ON THE GOALS AND OBJECTIVES OF THE WMO EDUCATION AND TRAINING PROGRAMME (ETRP)

Under this agenda item the Panel reviewed its Terms of Reference, membership and how it should interact with Technical Commissions and Regional Associations.

The proposed Terms of Reference for the next Financial Period are below.

3.1 Panel’s Terms of Reference

The Executive Council, at its sixty-third session (2011) decided (EC-LXIII, Resolution XX) “to maintain the Executive Council Panel of Experts on Education and Training to serve as an advisory body on all aspects of technical and scientific education and training in meteorology and operational hydrology with the following terms of reference:

- To promote and provide guidance on the education and training of personnel of Members, particularly in developing and least developed countries;
- To liaise with and respond to the WMO regional associations and technical commissions in the field of education and training within their respective areas of responsibility;
- To review the priorities and direction of the education and training activities undertaken by the Secretariat;
- To review the fellowships programme, providing guidance and advice on actions aimed at strengthening the programme and its effectiveness;
- To contribute to the preparation of the 2015 to 2019 WMO Strategic and Operational Plan by providing input, comments and recommendations with regard to the Capacity Building parts of the Plans;
- To recommend suitable WMO symposia, courses, workshops, seminars and distance learning opportunities;
- To advise on actions for strengthening the existing RTC network and for monitoring their activities as well as the designation of suitable training institutions as WMO

\(^1\) Synthesis of indicators such as: number of fellows still working in the service two years after completion; change in level of responsibility; change in type, quality or quantity of services provided by NMHS…
RTCS and encourage NMHS training centres to utilize the EC Criteria for RTCs in monitoring the quality of their programmes;

- To advise on and promote training resources and methodologies suitable for use by WMO RTCs, NMHSs and other training institutions;
- To collaborate with internationally-orientated education and training bodies in meteorology, hydrology and related fields;
- To consider any other matters relating to education and training which the Executive Council may specifically request”.

The Panel recommended that the Executive Council should continue the current practice of selecting Panel members who were actively involved in education and training in meteorology and hydrology. The Panel considered the composition and number of the Panel for the next financial period. The current number of members was seen to be a realistic balance of regional and language coverage as well as representation from CHy and should be continued if possible. If the budget continued at Zero Nominal Growth without supplementary resources, the Executive Council may have to consider reducing the number of members with a subsequent decrease in effectiveness of the Panel. Any savings should be retained in the ETR Programme.

Given the cross-cutting nature of the ETRP, the Panel noted it was essential to have information on priorities, and education and training opportunities and needs from the Technical Commissions and Regional Associations. The Panel noted the changes that were occurring to the structures of the Technical Commissions and Regional Associations and the need to establish robust communication and coordination mechanisms between the Panel and these bodies. Recent regional association sessions have typically abolished the role of Regional Rapporteurs leaving no obvious coordination point for the Panel to seek or receive information from each Regional Association and Technical Commission.

The Panel requested the Secretary-General to write to each of the Regional Association and Technical Commission presidents asking them to nominate an appropriate contact point for the Panel, and its members, to seek or receive information on education and training matters from the Region or Technical Commission. Noting that a number of the Technical Commission vice presidents were tasked with education and training responsibilities, the Panel indicated that the Vice Presidents of the regional associations and Technical Commissions would make excellent focal points.

4 IDENTIFICATION OF WMO HUMAN RESOURCE DEVELOPMENT REQUIREMENTS

4.1 Preparations for the follow on to the 4th edition of WMO Publication No. 258

The Panel noted that the fourth edition of WMO Publication No. 258 “Guidelines for the Education and Training of Personnel in Meteorology and Operational Hydrology, Vol I: Meteorology” was published in English in 2002 and has been an extremely useful and well used publication. At the fifteenth Congress in May 2007, this publication was included in the list of mandatory WMO publications. As a mandatory publication, WMO No. 258 should be updated and republished at least every eight years. The publication date of the English edition is used as the basis for determining the next publication date. The Panel thus noted that the follow on publication is nominally due in 2010. The Publication date for Vol II
Hydrology was 2003. The Panel was informed that the Commission for Hydrology will not be reviewing Vol II until at least 2013.

At its sixty-first session, the WMO Executive Council developed a new definition for a WMO Meteorologist and passed a resolution requesting the 16th Congress (Cg-XVI) to approve the new definition. As this is a critical factor in determining the classification of personnel and, at least in some countries, who can do what tasks, the Panel deemed it advisable to delay the publication until after Congress XVI in May 2011. The Panel noted that funds have been sought for the publication costs of WMO 258 Vol’s I and II in the 2012 to 2015 budget.

Panel Members recalled that reference from a “Standard” (WMO Technical Regulation 49, Vol I) to a “Guideline” (WMO Publication 258) had led to ambiguity in the area of qualifications for personnel involved in the provision of meteorological services to air navigation. The Panel thanked its Task Teams and the Commission for Aeronautical Meteorology Expert Teams for the progress they had made in resolving this issue. However the Panel also noted the necessity to learn from this experience in considering the way forward with referencing qualifications for aviation personnel in WMO Technical Regulations 49, Vol I.

The Panel appreciated the review of WMO Publication No. 258 carried out by Dr Bob Riddaway (one of the editors) on the current edition. The review critically examined the current edition and identified six key issues that need to be addressed when preparing the next publication.

- The definition of a Meteorologist.
- The inconsistencies/ambiguities in the way the categories of personnel and jobs are linked.
- The mixing of educational requirements and job competencies.
- The way Instruction Packages are specified.
- The specification of the BIP-M and BIP-MT.
- The overall content and structure of the publication.

The Panel considered all these issues and came to the following conclusions about the follow-up to the 4th edition of WMO No. 258.

- The requirements to be specified as a Meteorologist or Meteorological Technician should be only in terms of successful completion of the necessary courses of study for Meteorologists and Meteorological Technician (both the requisite and mandatory components). Annex III – DRAFT RESOLUTION FOR EC – LXII contains a draft resolution for EC to consider for recommendation to Congress XVI (Cg-XVI).
- Within the follow-up to the 4th edition of WMO Publication No. 258, there should be no links between categories of personnel (in terms of the WMO classification) and jobs. It should be for NMHSs and international regulatory agencies to decide what categories of staff should fill particular jobs.
- There should be a clear distinction between the educational requirements for categories of personnel and competency requirements for particular jobs.
- The specifications of the courses of study (including requisite requirements) should be more detailed than at present and they should be put in terms of learning outcomes. The learning outcomes should be critically reviewed during the preparation process to ensure that their level, definition and scope are appropriate.
• In the follow-up to the 4th edition of WMO Publication No 258, no distinction should be made between the full and condensed versions of the BIPs as the learning outcomes in both cases are the same.

• The specifications of the courses of study should be limited to requisite and mandatory components. Consequently the references to details about the existing optional components (i.e. “elective fields of specialization in meteorology”, “other fields of specialization” and “elective options in operational meteorology”) should be removed.

• The requisite requirements for the courses of study should be amended:
  1. For Meteorologists, the chemistry requirements should be removed (except for basic physical chemistry), as should the requirement for “international communication languages”. In addition “information and communication technology” should be treated as part of complementary requirements rather than as part of mathematics.
  2. For Meteorological Technicians, the chemistry requirements should be removed as should “introductory differential and integral calculus”. In addition “introduction to communication technology” should be retained, but not be considered as part of mathematics.

The follow-up to the 4th edition of WMO Publication No. 258 should be produced in three parts.

1. A publication that defines the categories of personnel and specifies the associated required courses of study. This could be considered as a successor to WMO No. 258 or treated as a new top-level mandatory publication. It would be appropriate for the title of the publication to clearly reflect its content.

2. A publication aimed at providing guidance to professionals involved in delivering education and training. This could include topics such as instructor competency requirements, the education and training process (including instructional methods, aspects of distance learning, needs analysis, planning, delivery, assessment and the development of school and public education programmes), and the process for developing job competencies and how such competencies can be assessed. This publication would be “owned” by the EC Panel of Experts on Education and Training and would not be a mandatory publication.

3. The specification of job competencies in publications prepared by bodies that have responsibility for specific areas of activity. For example, the detailed competencies for Aeronautical Meteorological Forecasters and Aeronautical Meteorological Observers would appear in a CAeM publication.

The Panel formed an Editorial Task Force for the publication to replace the 4th edition of WMO Publication 258. The first part of replacement publication should be ready for review by Cg-XVI. The second part should follow as soon afterwards as possible, The Editorial Task Force is composed of Mr Chris Webster, Mr LeRoy Spayd, the ETR Office and invited experts. The Editorial Task Force will call upon the Panel members to review the work, particularly in terms of language.
4.2 Preparations for the status report on WMO members training requirements, opportunities and capabilities in meteorology and hydrology

In the years 1985, 1989, 1994, 1998, 2002 and 2006 world-wide surveys on Members' training requirements, opportunities and capabilities were undertaken by the WMO Secretariat. The Panel considered that the introduction of Results Based Management to the WMO Secretariat in 2008 has provided the Education and Training (ETR) Office with the opportunity to review the rationale, methods and timing of these earlier practices. The Panel decided that, rather than relying solely on a survey every four years, the ETR Office should prepare a status report on at least a four yearly basis, including the information gathered from a survey and other sources, on Members training requirements, opportunities and capabilities. Whilst this is a subtle change it should make a major difference to the methods used and use of such a document. Noting the typical budget and planning cycle, the Panel decided that in order for it to be fully able to undertake its role of advising Executive Council and Congress on the WMO Education and Training Programme (ETRP), it would be more effective to carry out the sequence of activities shown in Table 1 during a financial period.

Table 1. Sequence of activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Notional year</th>
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<tbody>
<tr>
<td>ETR conduct trial survey and prepare report</td>
<td>2011</td>
</tr>
<tr>
<td>New financial period</td>
<td></td>
</tr>
<tr>
<td>First Panel session</td>
<td>2012</td>
</tr>
<tr>
<td>ETR conduct survey and prepare status report</td>
<td>2013</td>
</tr>
<tr>
<td>ETR Symposium held providing review of past work and options for future work</td>
<td></td>
</tr>
<tr>
<td>Second Panel Session to review plans for next financial period</td>
<td>2014</td>
</tr>
<tr>
<td>EC provide guidance on budget for next financial period</td>
<td></td>
</tr>
<tr>
<td>Congress approve plans and budget for next financial period</td>
<td>2015</td>
</tr>
<tr>
<td>New financial period</td>
<td></td>
</tr>
<tr>
<td>First Panel Session</td>
<td></td>
</tr>
<tr>
<td>ETR conduct survey and prepare status report</td>
<td>2016</td>
</tr>
<tr>
<td>ETR Symposium held</td>
<td></td>
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</tbody>
</table>

Table 2. Sequence of activities

Under this scenario, the Status Report could be debated at the ETR Symposium and this would provide a mechanism for the meteorological and hydrological education and training community to review the activities and achievements of the past four years and provide the Panel with input on the future direction and strategies for the Programme. The Panel would then have an opportunity to consider any recommendations from the Symposium and incorporate them, plus the views of Executive Council and the other groups, into the final framing of the ETRP budget and plans for the following financial period. The Panel noted that
under the current scenario, survey results come too late for the Panel or the ETR Office to explicitly use them in their planning for the next financial period.

The goals of the status report should include:

- An assessment of Members’ training requirements from an international perspective to identify common regional concerns, and major global trends;
- Establishment of world-wide priorities to provide a basis for adjustments and improvements in the planning and implementation of the WMO’s Education and Training Programme (ETRP);
- Exploration of Members’ capabilities and capacities to further assist WMO in meeting one of its major objectives and to assist Members in obtaining adequately educated and trained personnel for the continued development of their National Meteorological and Hydrological Services.

The Status report should also provide the data for determination of the Key Performance Indicators for the Programme (see discussion in agenda item 2.1).

With a high response rate, a global survey of Members’ training requirements could represent an objective basis for the assessment and planning of the WMO training activities and for introducing modifications and improvements to the ETRP. However the Panel noted that this is rarely the case. The Panel also noted that a four-yearly update cycle was too long. Taking into account the need to align this information with the performance monitoring of the Programme, the Panel recommended that the Secretariat make optimum use of the Country Profile Database attempting to have key data updated on a yearly basis.

The Panel suggested that the Executive Council request the Secretary-General to consider selecting and contacting a small group of representative Member states to seek their agreement to participate in an ongoing longitudinal survey. The number and selection of the members would have to be such to allow meaningful conclusions on the wider population to be drawn. The Panel also recommended that alternative data sources such as data and information from COMET, EUMETCAL, CALMET and the Virtual Laboratory be used in the assessment of the use of computer and distance learning and other learning methods.

4.3 Regional Training Centres (RTCs)

Review of training activities of WMO-RTCs during the period 2007-2009

The Panel reviewed reports for the period 2007 to 2009 from 16 of the 23 WMO-RTCs. No reports were received from the RTCs in Angola, Italy and Venezuela. Anecdotal information suggests these three institutions have not been internationally active as RTCs for a number of years. It is not known why the RTCs in Algeria, Costa Rica, Israel and EAMAC have not submitted their reports. However all four are active RTCs involved in short term training and/or long-term WMO fellowships.

In recognition of the critical role played by RTCs over the last 60 years and the requests for new RTCs, the Panel engaged in a vigorous and enthusiastic debate on the current status and future role for RTCs.
The Panel was briefed on the evolution of the RTCs from the late 1960s to the current period noting that the rationale for the establishment and support of RTCs had changed considerably over the period. In the late 1960s, particularly in RA I and RA III, there were very few institutions offering quality education and training in meteorology and or hydrology. At the same time there were significant funds available from development projects that provided many long term fellowship opportunities in the newly established RTCs in these regions. Now many more countries have institutions with some form of post secondary courses in meteorology or hydrology. At the same time, the large development projects have vanished meaning that the WMO Regular Budget is the primary funding source for fellowship opportunities.

The reports from the 16 RTCs were generally encouraging. The number of students completing "very short term" and "short term" training during the period 2007 to 2009 (Table 2) was 6732 from 431 training courses. The reports indicate that there were 4226 student-years of long term training in the same period (this equates to approximately 1000 students undertaking a 4 year training course). Foreign students represented more than 20% of the total number trained. The courses offered ranged from long-term MSc, BSc and Met Tech courses to short and very short-term courses in fields such as meteorology, climatology, agro-meteorology, aeronautical meteorology, weather forecasting, hydrology, integrated water resources management, satellite meteorology, numerical weather prediction or meteorological instruments. These fields of study represent some of the national priorities reflected in the 2006 survey - WMO/TD-No. 1154; Members’ Training Requirements, Capabilities and Opportunities

<table>
<thead>
<tr>
<th>Nr.</th>
<th>RTC Host Country</th>
<th>Nr. of Courses</th>
<th>Local Participants</th>
<th>Foreign Participants</th>
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<td>1</td>
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<td>Brazil</td>
<td>6</td>
<td>81</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>Barbados</td>
<td>21</td>
<td>38</td>
<td>223</td>
</tr>
<tr>
<td>6</td>
<td>China</td>
<td>27</td>
<td>332</td>
<td>520</td>
</tr>
<tr>
<td>7</td>
<td>Costa Rica</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Egypt</td>
<td>31</td>
<td>355</td>
<td>94</td>
</tr>
<tr>
<td>9</td>
<td>India</td>
<td>44</td>
<td>1109</td>
<td>19</td>
</tr>
<tr>
<td>10</td>
<td>Iran, Islamic Rep. Of</td>
<td>14</td>
<td>202</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>Iraq</td>
<td>10</td>
<td>91</td>
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</tr>
<tr>
<td>12</td>
<td>Israel</td>
<td></td>
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<tr>
<td>13</td>
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<td></td>
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<tr>
<td>14</td>
<td>Kenya</td>
<td>79</td>
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<td>330</td>
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<tr>
<td>15</td>
<td>Madagascar</td>
<td>9</td>
<td>88</td>
<td>6</td>
</tr>
<tr>
<td>16</td>
<td>Niger (EAMAC)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Niger (AGRHYMET)</td>
<td>12</td>
<td>29</td>
<td>144</td>
</tr>
</tbody>
</table>
Table 2. Summary of RTC course details for 2007, 2008 and 2009

The table above provides an indication of the RTCs that are actively involved in the training of foreign students and that are therefore fulfilling the main requirement for their establishment and the expectation of their respective regions. Overall, 99% of the training of foreign students including very short-term courses were carried out by 9 RTCs (Argentina, Barbados, China, Egypt, Kenya, Niger, Nigeria, Russia and Turkey). For long-term training (longer than 6 months), 10 RTCs (Algeria, Barbados, China, Egypt, Kenya, Niger-Aghrymet, Nigeria, Philippines and Russia) were internationally active. For short-term training (1 month to 6 months), 4 RTCs (Argentina, Barbados, Egypt and Kenya) were internationally active.

Taking into account the low foreign intakes reported by many of the RTCs and the changed circumstances since the RTC network was established, the Panel took the opportunity to review the overall concept and purpose of the RTC network.

The Panel considered the criteria for the establishment and reconfirmation of WMO Regional Training Centres. The existing criteria primarily focus on what is needed to become a WMO RTC but are relatively silent about criteria for reconfirmation. Concerns were expressed that some RTCs seeking reconfirmation might not qualify to be established but could in fact be reconfirmed. The Panel has recommended to EC that the eight year external review cycle include criteria similar to those applied when the RTC was originally proposed. The new criteria are presented in Annex IV–EC Criteria for the recognition and reconfirmation of Regional Training Centres and Annex V - Processing steps for Reconfirmation of RTCs.

External assessment of RTCs during 2008 to 2009

Following completion of the external assessments in the first review cycle in 2007 (with the exception of Iraq, which was not assessed due to the extended period of insecurity), the 23rd session of the Panel approved a schedule of assessments of RTCs for the second cycle (2008-2015) and nominated convenors for the assessments scheduled for 2008, 2009 and 2010. As a result, WMO-RTCs Costa Rica and Egypt were assessed in 2008 while WMO-RTCs Argentina, Barbados, Kenya and Madagascar were assessed in 2009. Each of the assessments was undertaken in a full team spirit and a high level of support from the host countries. On the whole, a satisfactory progress was reported in all cases while noting some of the difficulties and challenges faced by some. These include financial constraints, lack of adequate infrastructure, inability to run courses for foreign students, the need for improvements in the curriculum and the subjects being taught, and the introduction of new courses to reflect the development needs of the region. The absence of a formally concluded
agreement between WMO and the RTCs reviewed was also highlighted. However, it is worth mentioning that the agreements with RTCs Barbados and Egypt were finalized and signed on 12 June 2009 while efforts are continuing to have the remaining ones concluded.

In light of the general discussions on RTCs, the Panel considered the external assessment reports of the 6 WMO-RTCs that were assessed during 2008 and 2009. Table 3 summarises some of the common findings from the external assessments but the level of degree varies from RTC to RTC.

<table>
<thead>
<tr>
<th>RTC</th>
<th>No WMO - RTC agreement</th>
<th>Improve facilities and equipment</th>
<th>Improve Courses</th>
<th>Update staff skills</th>
<th>Improve teaching resources</th>
<th>Increase use of DL</th>
<th>Need to do TNA of Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barbados *</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Costa Rica</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Egypt *</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Kenya **</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Madagascar</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Common concerns in RTC external assessments. Degree of concern varies from RTC to RTC in each element.

* Memorandums of Understanding for Barbados and Egypt were concluded in June 2009

** No mention of MoU was made in the report but ETR records show no MoU in force.

Following a detailed examination and discussion of each of the external assessment reports, and the attendant documentation, the Panel recommended the immediate reconfirmation of the RTCs of Argentina, Barbados, Costa Rica, and Kenya. For the RTCs in Egypt and Madagascar, the Panel has recommended a delay in reconfirming their RTC status. For Egypt this is to provide them time to implement the arrangements with the University of Cairo that will better enable them to demonstrate the level of their course work and assessment procedures for international students. For Madagascar it will provide time for them improve their planning and coordination, liaison between the various components of the RTC and with WMO and, further develop the skills of their teaching staff and resources. The Panel noted and applauded the coordination that the RTC in Egypt is undertaking with the RTC in Nanjing and the development of links with the University of Cairo. The Panel anticipates that as these actions are implemented they will overcome the concerns about the assessment process for international students evident in the external assessment report. Similarly, the Panel noted and appreciated the willingness of the RTC in Madagascar to implement all of the recommendations in the external assessment report. Noting the direction of EC-LVIII which requested that the EC Criteria be strictly applied when assessing new RTCs or reconfirming existing RTCs, the Panel was obliged to recommend a delay in reconfirming the RTC status in these two cases. The Panel requested the Executive Council to ask the Secretary-General to assist these two RTCs within the limits of available resources. Annex VI - DRAFT RECOMMENDATION 4/1 (PAN-XXIV) - RECONFIRMATION OF RTCs ASSESSED DURING 2008 -2009
The Panel updated the schedule for assessments of RTCs for the period 2010 to 2012 (Annex VII – RTC External Assessment Programme).

The Panel noted a proposal by Mr Kent Johnson of Canada to standardize the format and process of RTC external reviews and endorsed his proposal. The report shall include statements about the degree to which the RTC meets the individual criteria required of RTCs to be reconfirmed. The Secretariat is requested to create a guideline and suggested format to be used for all RTC external reviews in the reconfirmation process.

**Review of requests for establishment of New WMO-RTCs**

The Panel noted that since May 2000, when the RTC-Turkey was established, the number of WMO-RTCs has remained at 23 (see Annex VIII- Current WMO RTCs). Since EC-LXI three formal offers to host WMO-RTCs have been received by the Secretary-General from the Permanent Representatives of Qatar, Peru, and South Africa, and one informal notification from Indonesia. The Panel was informed that in line with the current EC Criteria for the Recognition of RTCs approved by EC-LX in June 2008, the required actions have been initiated by the Secretariat in response to these requests.

The Panel noted the four pending proposals for the creation of new WMO Regional Training Centres in Qatar, Peru, South Africa, and Indonesia. Since the application of Qatar is complete, the Panel recommends that the EC approve the Qatar application pending a site visit by a representative of the Secretary General.

In the cases of Peru and South Africa the feedback from the Regional Associations through their Presidents and a visit of the representative of the Secretary-General are pending before the Panel can consider the proposal. For Indonesia a formal request, feedback from the Regional Association through the President and a visit of the representative of the Secretary-General are pending before the Panel can consider the proposal.

The Panel noted that this is the last Panel and EC session before the 16th WMO Congress in May 2011 and requested EC to allow these proposals to be presented to Congress for its consideration if they have completed all the formal steps prior to May 2011.

**4.4 Report of the Chair of the Task Team on Aviation Forecaster Qualifications (TT-AFQ)**

The Panel recalled that the Task Team on Aviation Forecaster Qualifications (TT-AFQ) was created by the WMO Executive Council Panel of Experts on Education and Training at its 23rd Session (Costa Rica, March 2008). Further directions were received from the sixtieth-session of the WMO Executive Council (EC-LX) in Geneva in June 2008 and these served as the TT-AFQ Terms of Reference. The TT-AFQ met at the Met Office HQ in Exeter, UK in February 2009.

The Panel noted that the TT-AFQ agreed that following completion of the BIP-M, a WMO ‘Meteorologist’ could specialize in areas such as aeronautical meteorology although this specialization would require additional education, as well as vocational training, including extensive supervised on-the-job training. Such training should be designed to ensure the competency of personnel to supply meteorological services to air navigation.
The Panel noted that EC-LXI in June 2009 endorsed this view and approved the TT-AFQ proposal that Aeronautical Meteorological Personnel (AMP) competence standards be included in WMO-No. 49 Vol. I. EC-LXI also recognized the importance of developing the appropriate guidance materials to assist Members in assessing the competence of their AMP and requested that, in close coordination with the Panel, these materials be made available as soon as possible.

The Panel also noted that EC-LXI approved the TT-AFQ proposal that from 2016 an AMF must be a WMO ‘Meteorologist’. This means that in order to comply with the Aeronautical Meteorologist Standards all air navigation meteorological service providers will have to both provide clear evidence that their AMF meet the competence standards and that WMO-No. 258 ‘Meteorologist’ qualification guidelines have been followed.

Noting the recent decision by the Commission for Aeronautical Meteorology to form a Task Team on Competency Assessment Toolkit (TT-CAT, see agenda 5.4 for this session) and the links between that Task Team and the Panel, the Panel recommended the dissolution of the TT-AFQ. The Chair of the Panel thanked the TT-AFQ and its Chair, Mr Ian Lisk, for their extremely useful work and response to the challenges set by the Panel and EC-LXI.

4.5 Report of the Chair of the Task Team on Distance and Online Learning (TT-DOL)

The Panel recalled that the Terms of Reference for the Task Team on Distance and Online Learning (TT-DOL) were:

- Identify suitable accredited online undergraduate courses available to all Members;
- Identify suitable accredited online courses to support the recommendations from the Task Team on Aviation Forecaster Qualifications (TT-AFQ) taking into account subsequent views of the Panel and EC-LXI;
- Identify strategies to enhance the availability of online undergraduate courses and degree programs in meteorology.

The Panel was informed that the TT-DOL held its first meeting at the Caribbean Institute for Meteorology and Hydrology (CIMH) from 23 to 27 November 2009. Using data from a survey conducted in the second half of 2009, and the experience and knowledge of the TT-DOL members, the Panel noted that it was not possible to identify:

- Any suitable completely online courses that would satisfy both the degree and the Basic Instruction Package – Meteorology (BIP-M) requirements;
- Any suitable accredited online courses that support the recommendations of the TT-AFQ were identified.

The Panel was informed that a great deal of material was identified that could be used to create online courses. The Panel warmly welcomed the proposal from CIMH to develop, in collaboration with COMET an on-line aeronautical meteorological forecaster training demonstration project. The project would look to build on existing capabilities whilst also seeking to identify and address the issue of missing on-line resources.
The Panel concluded that the best way to meet the Members need for a cost-effective online programme that met BIP-M requirements would be for interested Members to create a consortium to develop, test, implement and maintain such a program. This would not have to be a full graduate programme but it would need to meet the requirements of the BIP-M and specialize in the knowledge requirements for operational meteorology.

As a strategy to enhance the availability of online undergraduate courses and degree programs in meteorology the TT-DOL suggested that the Panel could assist Members by:

- Promoting more virtual communities using as a model the WMO Virtual Laboratory for Satellite Education;
- Enhancing the current online training calendar to become a global calendar of training events;
- Increasing assistance to Members, in particular RTCs, in developing their staff to create and deliver online learning; and
- Maintaining the TT-DOL from the last Session to continue work on enhancing Distance and Online Learning in WMO

The Panel noted the positive benefits of the proposed approaches:

- First and foremost, implementation of these recommendations should improve the opportunities and quality of education and training available to WMO Members;
- They provide Members with a range of pathways to develop personnel to the level of WMO Meteorologist and beyond;
- They build upon existing material;
- They are consistent with the original intention of the fourth edition of WMO-NO. 258; and,
- They encourage the participation of new partners and approaches being used with the WMO Education and Training Programme.

### 4.6 The WMO Fellowship Programme

The Panel recalled that the WMO Fellowship Programme was established in 1960 in response to an urgent need by Members to train meteorological staff. At the outset, WMO long-term fellowships covered attendance at universities, beginning with undergraduate studies in mathematics and physics, as a preliminary to a course in meteorology. Later, fellowships were broadened to include meteorology, hydrology and related environmental studies. Studies of shorter duration were also included. Funding for long-term fellowships included mechanisms such as the New Development Fund (1965), the Voluntary Assistance Programme (VAP) (1968) and UNDP funds. In 1967, Cg-V decided for the first time, to approve Regular Budget funds to finance long-term fellowships.

#### Evaluation of the WMO Fellowship Programme

The Panel noted that in July 2009 the Internal Oversight Office (IOO) of WMO commenced an impact evaluation of the WMO Fellowship Programme.
The Panel was further informed that the evaluation method was based upon the contribution analysis approach recommended by the UN Fellowship Officers. The draft report examined the internal processes and documents within the ETR Office and also the reports from the former Fellows and their Permanent Representatives. The Panel was informed that the overall summary of the draft report was positive but the “findings are insufficient to conclude whether the enhanced capacities are being translated into concrete benefits for the NMHSs and Members (“Outcomes 2” and “Impact” at the national level). To ascertain this would require the soliciting of information from NMHSs.”

The Panel noted that the draft evaluation report indicates some areas where the ETR Office needs to improve its performance. One of these is in the design and collecting of information from the various feedback reports. The Panel was advised that the draft report is to be considered by the Secretary-General. Once the SG has approved the report for release it will be considered by the FELCOM who will make recommendations on whether to continue with the evaluation project.

**Familiarisation visits – Assisting new Permanent Representatives to understand the role of WMO and its Members**

The Panel noted that familiarization visits for new Permanent Representatives (PR) are an important activity supported by the WMO Fellowship Programme. A typical PR visit includes Geneva, an NMHS in a country hosting a Regional Centre of some kind and an NMHS in country from their region that is relatively more developed than their own country. No more than 3 days are spent in each country. Forty five familiarization visits have occurred since 2004.

Panel members noted that, whilst familiarization visits are of benefit to the PRs, the WMO Secretariat and to the host countries they constitute direct costs to the fellowship funds. After extensive discussion the Panel recommended that, if Congress set another ZNG budget, funds provided for the ETRP should not be used for familiarization visits.

**Fellowship Manual**

The Panel noted that the WMO Fellowship Manual was published in 2006 and brings together all of the information and forms required by Permanent Representatives and Fellows for nomination and reporting on Fellowships.

Noting the comments from the draft evaluation report on flaws in the design of the fellow feedback reports and the reports from the ETR Office regarding the Fellowship Nomination Forms and interpretation of sections of the Fellowship Manual the Panel recommended a review and update of the Fellowship Manual. The Panel anticipated that major changes would not be required but it will take some time to document and review the current Manual and prepare new forms with editable online versions to improve readability and response rates.

**Aligning Fellowship Placements and Funding to WMO Priorities**

The Panel noted that until 2007 the WMO Fellowship Programme has largely been reactive, that is, the demand for Fellowships has been driven by the needs of the WMO Members. In
2007 WMO negotiated an agreement with the Government of China whereby the Chinese Scholarship Council agreed to provide 10 new scholarships each year for WMO Fellows from Africa to study meteorology or hydrology in China. This has lead to a small, but significant, change in the WMO Fellowship Programme.

From 2007 onwards an advertising and selection campaign for study opportunities in either China or the Russian Federation are now conducted. The Panel noted that the Fellowship Programme is still reactive to the needs of Members but the demand is more organized. The downside of this approach is that between 45% and 55% of the Fellowship funds support fellows in two countries. The positive side of it is that it would not be possible to provide up to 15 places for BSc or MSc studies in institutions with the same prestige in other parts of the world for the same amount of funds. The Panel recommended that Executive Council consider advertising a small number of fellowships in high priority areas on an annual basis in leading institutions if co-sponsoring from funding agencies in appropriate countries can be identified.

The Panel recalled that many of the RTC external assessment reports make recommendations regarding re-skilling or updating of the staff at the RTC (agenda 4.3 of this Session). The Panel encouraged the Secretary-General to seek expressions of interest from personnel in universities in the developed countries for sabbaticals in the RTCs to provide specialist courses and work with the RTC staff to revamp courses or create new courses in areas such as the socio-economic impacts of meteorological services (this would partially address one of the recommendations from the 2007 Madrid Conference). The Panel also noted that it may be possible to request funds from VCP (F) for such purposes.

The Panel requested Executive Council to remind Permanent Representatives that Fellowships could be awarded to personnel not employed by NMHSs. For some countries this may improve the pool of qualified and skilled staff suitable for recruitment to NMHSs and in other cases could improve the staff in education and training institutions.

### 4.7 School and Popular Education including GLOBE

The Panel was informed of the activities related to School and Popular Education over the last six years:

- WMO-Co-sponsorship and participation in International Conferences on School and Popular Meteorological and Oceanographic Education, also known as Education: Weather, Ocean and Climate (EWOC)
- Publication of the book: "A CAREER IN METEOROLOGY”.
- Signing of agreed Terms of Reference between WMO and the National Aeronautics and Space Administration (NASA) in February 2007 allowing the GLOBE Program and WMO to collaborate in promoting environmental education around the world
- Organizing a meeting of the WMO Expert Group on Public Education and Outreach which provided guidance and recommendations on the establishment of a public education programme
- Informing Members of WMO efforts in promoting school and public environmental education through circular letters sent by the Secretary-General to all Members, the WMO and GLOBE websites and other means
- Participation of WMO in the annual GLOBE Conferences and regional seminars
- Participation of GLOBE in WMO organized events including the Training Workshop for Regional Training Centres (Langen, Germany 22 October 2008)
- WMO hosting and co-sponsoring a planning meeting for GLOBE student research campaign on climate change 2011-2013 in January 2009
- GLOBE active involvement and participation in the World Climate Conference-3 (WCC-3) in August 2009.
- The participation of GLOBE in the First Conference of African Ministers responsible for Meteorology in Africa (Nairobi, April 2010) is also envisaged.

Dr Ed Geary, Director of the GLOBE Programme, made a presentation and held discussion with members of the Panel on the GLOBE Student Climate Research Campaign (SCRC). The Campaign - *Engaging Youth to Understand Climate* which is a two-year event that proposes to engage more than 1,000,000 students from around the world in the process of investigating and researching their local climate and sharing their findings globally. SCRC is comprised of learning activities, international collaborative discussions on climate, data collection, and short-term and longer-term research investigations. The Panel congratulated Dr Geary and the GLOBE program on this innovative program and recommended that the Secretary-General write to all PRs advising them of the program and encouraging them to contact their national GLOBE Country Coordinators to identify opportunities for the NMHSs to support the SCRC. Noting the role that WMO could play in the SCRC within the framework of the *agreed TOR*, the required actions would also further develop and implement the WMO school and public environmental education programme at the national and regional level during the next Financial Period. The benefits of such efforts would include:

- Enhancing the credibility of NMHSs by directly supporting educational activities aimed at students and the general public;
- Improving the integration of science, mathematics and information on weather, climate and water into the day-to-day learning process in schools;
- Creating an informed and educated public that will have a better appreciation of the services and products provided by NMHSs, especially in relation to meteorological and hydrological hazards;
- Helping communities to enrich their lives by gaining a greater understanding of the natural world and the meteorological and hydrological events affecting them.

The Panel recognized the need to foster partnership and closer collaboration with other organizations and programmes involved in school and popular education, such as COMET, to develop specific programmes for children in areas such as natural disasters (tsunami). The generalization and distribution of such material could subsequently become a WMO project. Furthermore, the Panel took note of the CMA funding from the Government of the People’s Republic of China for school education and that CMA is in a position to contribute to the WMO school and popular education activities. The Panel recognized the importance of engaging school children in matters related to weather, climate and water and proposed that activities should be carried out in a step-wise manner. The Panel proposed to the Executive Council to express its opinion on this matter as it is of global interest for subsequent consideration by Congress Cg-XVI
5   ETRP TRAINING ACTIVITIES

5.1    Eleventh WMO education and training symposium (SYMET XI)

The Panel, at its twenty-third session in Costa Rica in March 2008, set the theme for the 11th WMO Education and Training Symposium (SYMET-XI) as “New Approaches to the Education and Training for Meteorological and Hydrological Forecasters”.

Host Country

The Panel was informed that the Permanent Representative of Indonesia with WMO had formally written to the Secretary-General offering to host the Symposium in its new training facilities at Jalan Raya Puncak Bogor, West Java, Indonesia from 25 to 29 October 2010. This area is also known as Citeko. Figure 1.

The Panel noted that costs for the Symposium essentially fall into four separate categories:

- Facility and hospitality costs – typically borne by the host country
- Interpretation – in at least four WMO languages (English, French, Spanish and Russian) typically borne by WMO
- WMO staff travel costs – borne by WMO
- Limited support for participants and possible keynote speakers

The Panel was informed that interpretation makes up a significant portion of the cost of the meeting and due to the working rules and regulations can restrict the length of sessions. After some discussion the Panel confirmed that to ensure as many participants as possible would benefit from the Symposium at least the four languages noted above should be supported.

The Panel established an International Program Committee consisting of (Kent Johnson (Chair), Vilma Castro, LeRoy Spayd and Pat Parrish) to assist the ETR Office in developing the program, suggesting keynote speakers, selecting papers and seeking support for NMHS and RTC staff to participate in the Symposium. The Panel requested the ETR Office to work with the Chair of the Programme Committee to include someone from the
host country and one or two other members to provide a balanced coverage. A draft copy of
the Symposium program is at Annex IX ETR Symposium

5.2 Proposed Training events for 2010

The Panel noted with pleasure the Training Plans of WMO Departments and the RTCs
gathered by the ETR Office. Between them, fourteen RTCs are running 157 education
programmes and training activities in 2010. Up to date information on the programmes can
be obtained from http://192.91.247.60/etr/aspscripts/search_country.n.asp

5.3 Proposed Training Activities For 2012 To 2015

The Panel was informed that in preparation for EC-LXII and Cg-XVI, the ETR Office had
provided input into the three budget scenarios the Secretary-General will be presenting for
the 2012 to 2015 Financial Period. The proposed activities are based upon the existing
capacity building activities in the ETRP for the 15th Financial Period as well as guidance from
EC-LXI and other bodies on the priorities for the next financial period.

The three budget scenarios were:
• Zero real growth plus (ZRG Plus)
• Zero real growth (ZRG)
• Zero Nominal growth (ZNG)

A high level summary of the education and training funds for each scenario is presented in
Table 4 and is compared with the ETRP funds approved by Cg-XV

<table>
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<tr>
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<th>15th FP</th>
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<th>ZRG</th>
<th>ZRG Plus</th>
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</thead>
<tbody>
<tr>
<td>Fellowships</td>
<td>3,600</td>
<td>3,160</td>
<td>3,160</td>
<td>3,200</td>
</tr>
<tr>
<td>Training activities supporting DRR</td>
<td>632</td>
<td>570</td>
<td>570</td>
<td>1,110</td>
</tr>
<tr>
<td>Training activities supporting climate and agriculture</td>
<td>512</td>
<td>360</td>
<td>360</td>
<td>810</td>
</tr>
<tr>
<td>Training activities supporting observations and communications (WIS / WIGOS)</td>
<td>270</td>
<td>140</td>
<td>140</td>
<td>402</td>
</tr>
<tr>
<td>Training activities supporting Hydrology</td>
<td>218</td>
<td>120</td>
<td>120</td>
<td>162</td>
</tr>
<tr>
<td>Human Resource Development activities including ETR Symposium</td>
<td>1,736</td>
<td>716</td>
<td>716</td>
<td>1,036</td>
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<td>ETR Office expenses including publications</td>
<td>378</td>
<td>341</td>
<td>341</td>
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<tr>
<td>Liaison with international organizations</td>
<td>60</td>
<td>20</td>
<td>42</td>
<td>48</td>
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<tr>
<td>Governance</td>
<td>290</td>
<td>240</td>
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<td>240</td>
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<tr>
<td>Total</td>
<td>7,696</td>
<td>5,667</td>
<td>5,689</td>
<td>7,349</td>
</tr>
</tbody>
</table>

Table 4. Funding categories and totals for the 15th financial period and for 2012 to 2015
education and training activities in thousands of Swiss Francs.

The Panel noted that under ZRG Plus, funding has been injected into the four priority areas
of:

Global Framework for Climate Services (GFCS)
1. GFCS is supported through provision of additional education and training funds for:
   • climate forecasting, monitoring and evaluation activities;
• agricultural meteorology activities;
• end user training activities for climate weather and farming; and
• support for climate related observations and instrument activities.

2. Meeting the challenges of data and information
• Provision of new education and training funds for WIS / WIGOS; and
• Additional funds for satellite and instrument related training.

3. Making the world safer by mitigating disaster
• Provision of new education and training funds to DRR; and
• Provision of additional funding to PWS, GDFPS, Hydrology and Tropical Cyclone Programmes.

4. Capacity building
• Increased support for Regional activities;
• Fellowship funds closer to 2008 to 2011 levels;
• Additional funding for Train-the-Trainer, Curriculum Development and Management of NMHS Training Institutions; and
• Additional funding for Human Resource Development and Capacity Building Training.

If the ZNG is adopted, the Panel requested the Executive Council to seek additional means of increasing the budget to this vibrant and cross-cutting programme to the same level as the 15th to allow the ETRP to meet the priorities for the 16th Financial Period

5.4 Aeronautical Meteorological Personnel Competence Assessment Framework

Responding to the recommendations made at the EC Panel of Experts on Education and Training (Panel) meeting in Costa Rica in 2008 and the subsequent resolution arising from EC-LX (2008), the Task Team on Aviation Forecaster Qualifications (TT-AFQ) recommended to EC-LXI (2009) that a set of competence Standards for aeronautical meteorological forecasters and observers be developed for inclusion in WMO No. 49 – Technical Regulations, Volume I in November 2010 with these due to become mandatory Standards in November 2013.

EC-LXI endorsed this recommendation and, since June 2009, the CAeM Expert Team on Education and Training (ET/ET), in cooperation with the WMO ETR Office, has been working to develop a draft set of ‘top level’ Aeronautical Meteorological Personnel (AMP) competence Standards together with a supporting set of ‘secondary level’ competence descriptions and related criteria.

Developments and Actions Arising from the Second Meeting of the CAeM Expert Team on Education and Training

During the second meeting of the ET/ET in Barbados in December 2009, it was proposed that the work currently being done by the TT-AFQ to assist Members in developing an AMP competency assessment guidance publication (compliance tool-kit) should be owned and maintained by CAeM. The ET/ET meeting also agreed that this compliance tool-kit should,
with the planned publication in early 2012 of WMO No. 258, Fifth Edition, replace Supplement No. 1 to WMO No. 258 and should include the following:

- A copy of the ‘top level’ competency Standards contained in WMO No. 49;
- Competence descriptions and related criteria;
- Case studies of existing best practice from around the world.

The ET/ET agreed on the importance of continuing to work closely with the WMO ETR Office, through the Panel, and with other international training programmes such as COMET and EUMETCAL. This would help to ensure that the aviation related training strategies of these programmes are better aligned with Members’ needs and ICAO requirements following the introduction of the mandatory AMP competence Standards in 2013.

**WMO CAeM-XIV**

CAeM-XIV took place in Hong Kong, China between the 3rd and 10th of February 2010. The draft AMP competence Standards were endorsed by the Commission and will now go to EC-LXII in June for final approval. Subject to this approval the competence Standards will be included in WMO No. 49 Volume I, Technical Regulations in November 2010 with a mandatory enforcement date of November 2013.

CAeM-IV agreed that the development of a framework for the assessment of AMP should focus on the development of a competence Standards ‘compliance tool-kit’ and that this should be one of the four high priority outcomes delivered by the Commission during the inter-session period. The Commission further agreed to establish a ‘Task Team,’ chaired by Kent Johnson (Canada) to develop the compliance tool-kit. The TT-CAT (Competence Assessment Tool-kit) has since submitted an ambitious work plan that looks to deliver on the compliance tool-kit by the end of December 2011.

**6 IDENTIFICATION OF GAPS BETWEEN DEVELOPMENT REQUIREMENTS AND CURRENT PLANS AND OPTIONS TO REDUCE THE GAPS**

Having reviewed the current and proposed education and training plans against the wider WMO priorities the Panel noted that the resources available to the ETRP were insufficient to meet all of the proposed demands in a meaningful manner. The Panel additionally noted that there appeared to be little or no development within the NHMSs of education and training material related to the socio-economic benefits of meteorological and hydrological services. As this was one of the key education and training areas identified in the Madrid Action Plan some attention in the RTCs and NMHS training institutes was needed.

**7 REPORT ON THE EDUCATION AND TRAINING OFFICE**

**Status Report on the WMO Education and Training Office**

The Panel recalled that the WMO ETRP is overseen by the WMO Education and Training (ETR) Office which is part of the Department of Development and Regional Activities within the WMO Secretariat. The ETR Office is composed of the Director and two Divisions, one covering Training (TRA) and the other Fellowships (FEL).
Funding

The Panel was informed that Congress XV approved funds for the ETR Office of approximately 13.4 million swiss franc from the Regular Budget for the current financial period. Approximately half of this is staff costs for the ETR Office and the remainder for Fellowship and Training activities. Fellowship funds for this financial period amount to around 3.6 million swiss francs. The Training funds essentially split 50/50 for activities carried out by the ETR Office and funds contributed towards training by the Technical Departments. In addition to funding training activities, publications, support to the RTCs and coordination with UN Organisations, the ETR Office Training funds also cover the Panel and the WMO ETR Symposium.

The Panel further noted that under the Voluntary Contribution Programme (VCP) up to 500,000 swiss francs are available this financial period to support short term education and training requests by Members to participate in education and training provided by other WMO Members. Some of these activities fall under Fellowships and the rest under Training.

The Panel was informed that the inclusion of the ETR Office within the wider Development and Regional Activities Department on 1 January 2008 had required some budgetary adjustments to make best use of staffing across the Department and avoid duplications in capacity building activities.

Liaison and Coordination

To provide effective support for the WMO Education and Training Programme the Panel noted that the ETR Office has strong internal and external liaison and coordination links. Internally within the Secretariat these formally occur via the Training Management Team (TMT) and the WMO Fellowships Committee (FELCOM).

The Panel recalled that coordination and liaison with Members formally occurs through the Secretary-General and on general information issues via the National Focal Points on Education and Training, the RTCs mailing list and through CoCOM. Since the last session of the Panel the number of Education and Training National Focal Points (NFPs) has risen from 115 to 141 with NFPs now in 132 countries. Coordination with other UN organizations is more limited but includes the Fellowship Division where the Chief of Fellowships is part of a UN wide Fellowship Officer network.

Activities and Outcomes

The Panel noted that the most significant outcome over the last two years has been the progress made towards resolving the long standing issue of aeronautical meteorological personnel qualifications, particularly those of the aeronautical forecasters. Other important training outcomes have been:

- the strong liaison built between the ETR Office and a number of WMO Members (in particular, but not restricted to Hong Kong Observatory, Korea Met Administration, Pakistan Meteorology Department, CMA Turkey Met Service and the UK Met Office, USA NWS) regarding the content, planning, advertisement and candidate selection for training events run by these Members;
• improved knowledge and understanding regarding the RTCs by the ETR Office through staff involvement in the external assessment missions;
• more involvement in capacity building initiatives within the WMO Secretariat through the creation of the DRA Department and participation in regional projects; and,
• ongoing improvements in the WMO Train-the-Trainer workshops to better meet the needs of NMHS and RTC trainers.
• The increased use of distance learning within the Secretariat and Member organizations. The panel complimented COMET and the WMO ETR Office and Hydrology Dept on the recent virtual course on hydrology which was an excellent indication of how training events could go in the future.
• Closer collaboration with GLOBE on school and popular education activities.

The Panel congratulated the ETR Office on the quality and quantity of the activities carried out over the last two years particularly with the staffing and resource constraints.
**Next Meeting**

The Panel agreed that its next session be organized in the first quarter of 2012. The Panel noted with appreciation the offer from Mr C. Webster on behalf of the Met Service of New Zealand to host the next meeting in Wellington, New Zealand.

**APPROVAL OF THE DRAFT REPORT**

The Panel reviewed the draft report of the session and approved it, subject to the inclusion of agreed corrections and editorial amendments.

**CLOSURE OF THE SESSION**

The Chairman of the session expressed his satisfaction with respect to the constructive spirit in which the Panel worked throughout the present, as well as previous sessions. He thanked the Panel for the increased understanding of Education and Training matters that he had developed over the last 8 years. Education and Training is very important to all NMHSs, particularly those in developing and least developed countries. The limited finances available to the ETRP in WMO did not correlate with the importance of the work the Panel oversees.

He commented on the positive aspects of holding the Session outside Geneva to allow the Panel to meet the staff of key partner organizations such as COMET and the parent organisations. In closing he congratulated the interpreters on their excellent work and once again thanked the host country, UCAR and COMET for their excellent arrangements and the work done by the local organizers.

The session was closed on 26 March 2010 at 1642 PM
Annex I - REVISED AGENDA

1. ORGANIZATION OF THE SESSION
   1.1 Opening of the session
   1.2 Approval of the agenda
   1.3 Programme of work

2. MAJOR OUTCOMES OF EXECUTIVE COUNCIL AND REGIONAL ASSOCIATIONS
   2.1 Update on the status of Strategic and Operational Plans from an Education and Training perspective

3. EXCHANGE OF VIEWS ON THE GOALS AND OBJECTIVES OF THE WMO EDUCATION AND TRAINING PROGRAMME (ETRP)

4. IDENTIFICATION OF WMO HUMAN RESOURCE DEVELOPMENT REQUIREMENTS
   4.1 Preparations for the 5th edition of WMO No. 258
   4.2 Preparations for the Status Report on “Members Training Requirements, Opportunities and Capabilities in Meteorology and Hydrology”
   4.3 Regional Training Centres (RTC)
   4.4 Report of the Chair of the Task Team on Aviation Forecaster Qualifications (TT-AFQ)
   4.5 Report of the Chair of the Task Team on Distance and Online Learning (TT-DOL)
   4.6 The WMO Fellowship Programme
   4.7 School and Popular Education including GLOBE

5. PLANNED TRAINING ACTIVITIES AND APPROACHES TO MEET THE DEVELOPMENT REQUIREMENTS
   5.1 Eleventh WMO Education and Training Symposium (SYMET XI)
   5.2 Proposed Training events for 2010
   5.3 Proposed Training Activities for 2012 to 2015
   5.4 Aeronautical Meteorological Personnel Qualifications and Competencies

7. REPORT ON THE EDUCATION AND TRAINING OFFICE
   7.1 Status Report on the WMO Education and Training Office

8. DATE AND PLACE OF NEXT SESSION

9. APPROVAL OF THE DRAFT REPORT

10. CLOSURE OF THE SESSION
# Annex II - LIST OF PARTICIPANTS

## MEMBERS

<table>
<thead>
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<td>Mr Patrick PARRISH</td>
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Annex III – DRAFT RESOLUTION FOR EC – LXII

Res. 4.2/X (EC-LXII) - DEFINITION OF A WMO METEOROLOGIST

THE EXECUTIVE COUNCIL,

Noting:

The discussion of EC-LXI and the subsequent Resolution 4.2/2 (EC-LXI) - Qualification and competency requirements for aeronautical meteorological personnel

Noting further:


The desirability of maintaining consistency between the definition of a Meteorologist and a Meteorological Technician

Considering:

The lack of clarity in the formulation of the required qualifications of aeronautical meteorologists of “a degree or equivalent”,

Considering further:

The proposed changes to the description of the requisite topics in WMO 258, Section 3.1 for the Basic Instruction Package - Meteorology (BIP-M) in the successor publication to the 4th edition of WMO Publication 258 Vol I.

‘The recommended way for addressing the requisite topics is through the completion of a degree in mathematics or a physical science although responsibility for defining the national or regional level of requisite academic qualification will ultimately lie with the Members concerned.’

Proposed Requisite topics
Mathematics topics
Physics topics
Proposed Complementary requirements (communication and presentation techniques; information and communication technology; basic physical chemistry).

Requests:
Congress to amend the definition of “Meteorologist” as given in the successor publication to the 4th edition of WMO-No. 258, “Guidelines for the Education and Training of Personnel in Meteorology and Operational Hydrology” Volume I: Meteorology, to read: “Meteorologist – a person who has successfully completed the Basic Instruction Package for Meteorologists (BIP-M)”;
Annex IV–EC Criteria for the recognition and reconfirmation of Regional Training Centres

EC Criteria for the Recognition of WMO Regional Training Centres

I. RECOGNITION

To be designated as a WMO Regional Training Centre (WMO-RTC), institutions which undertake training in meteorology, hydrology and related sciences shall satisfy the following criteria:

A Centre is established only to meet the expressed requirements of two or more of the Members that cannot be met by existing facilities;

A Centre is designed to meet the requirements of the Region, as expressed in a decision of the regional association as recorded in a resolution or statement in the general summary of the Abridged Report or, during an intersessional period, upon the request of the president of the regional association, after consulting all its members;

The Centre is located within the particular Region concerned and its location decided by the Executive Council, in the light of the views of the regional association, or its president after consulting its Members, the advice of the technical commission concerned and the EC Panel of Experts on Education and Training, and the comments of the Secretary-General;

The following conditions shall apply to each Centre:

The Centre is open to students from all countries in the Region and, upon request, to interested countries in other Regions;

The education level of the various courses of instruction carried out at the Centre is consistent with the guidance material issued by WMO;

The Centre has processes in place to identify training needs of the region and to evaluate the training provided;

The Centre has adequate buildings and training facilities, and has the necessary equipment and facilities for an efficient and effective use and exchange of training resources and modules based on modern technology;

The Centre has competent instructors in terms of their technical ability and training skills;

The Centre has adequate arrangements for administration, governance, planning and self-assessment;

(e) The establishment and maintenance of the Centre is largely the responsibility of the host organization. The WMO shall have the right to monitor the work of the Centre.

The designation of an RTC will last for a specified period as described in the signed agreement in Part III of this document. This specified period shall not exceed eight years.

II. RECONFIRMATION
Every RTC must be reconfirmed at least once in every eight year interval. To be reconfirmed as a WMO Regional Training Centre (WMO-RTC), institutions which undertake training in meteorology, hydrology and related sciences shall satisfy the following criteria:

The RTC must re-apply using the RTC Self-Assessment Form.

A Centre shall meet the expressed requirements of two or more of the Members. The number of international students will be considered in assessing this criterion.

The following conditions shall apply to each Centre:
- The Centre is open to students from all countries in the Region and, upon request, to interested countries in other Regions;
- The education level of the various courses of instruction carried out at the Centre is consistent with the guidance material issued by WMO;
- The Centre has processes in place to identify training needs of the region and to evaluate the training provided;
- The Centre has adequate buildings and training facilities, and has the necessary equipment and facilities for an efficient and effective use and exchange of training resources and modules based on modern technology;
- The Centre has competent instructors in terms of their technical ability and training skills;
- The Centre has adequate arrangements for administration, governance, planning and self-assessment;
- The sustainability of the Centre will largely be the responsibility of the host country or organization. The WMO has the right to monitor the work of the Centre.

III. WRITTEN AGREEMENT

The obligations of WMO and the host country shall be the subject of a signed Agreement to abide by certain principles between WMO and the host country, and this will cover the following matters:

The purpose and functions of the Centre;

The number and entrance qualifications of students;

The right of WMO to examine syllabi and other relevant material to ensure that the level of education and training is consistent with the guidance material issued by WMO (e.g. publication WMO-No. 258 and its supplements);

The administrative arrangements of the Centre;

WMO obligations - financial or otherwise;

Obligations of the host organization;
Obligations of the Centre;

Withdrawal of the designation of the Centre;

Expiration or Termination of the Agreement.
Annex V - Processing steps for Reconfirmation of RTCs

The normal procedures for the recognition or reconfirmation are therefore as follows:
A Member wishing to offer its national training facilities as a WMO RTC submits its proposal for consideration and recommendation by the regional association or by the President of the Regional Association on behalf of the Regional Association concerned.

A representative of the WMO Secretary-General will survey the training facilities and programs and assess their compliance with the criteria for the recognition of WMO RTCs. This may include a site visit to the proposed RTC.

The recommendation of the regional association or its President and the report of the Secretariat mission are considered by the EC Panel of Experts on Education and Training or by its Chairman on behalf of the Panel.

The Panel's recommendation is considered by the Executive Council.

After endorsement by the Executive Council, the establishment of the centre is subject to an agreement which is drawn up between WMO and the host country. Contents of this agreement are specified in Section III.
Annex VI - DRAFT RECOMMENDATION 4/1 (PAN-XXIV) - RECONFIRMATION OF RTCs ASSESSED DURING 2008 - 2009

The EC Panel of Experts on Education and Training

Noting that the external assessment missions undertaken during 2008 and 2009 for RTCs in Argentina, Barbados, Costa Rica, Egypt, and Kenya have shown that these RTCs meet most of the EC Criteria for the Recognition of WMO RTCs, and aspire to meet them all,

Recommends to the Executive Council of WMO to reconfirm the status of RTCs in Argentina, Barbados, Costa Rica and Kenya as WMO recognized Regional Training Centres for another 8 years. Future reconfirmation of these RTCs should be dependent on implementation of the agreed assessment recommendations from this cycle of assessments.

Further Recommends to the Executive Council of WMO to delay the reconfirmation of the WMO RTC in Egypt until the Executive Council has been advised by the EC Panel that the corrective measures relating to assessment of international students, issuing of certificates and evaluation of training are implemented.

Further to delay the reconfirmation of the WMO RTC in Madagascar until the Executive Council has been advised by the EC Panel that the corrective measures relating to improvements in the skills of the teaching staff, improvements in training documentation and resources and record keeping of students are implemented

Noting the serious nature of the delay in reconfirming the status of these RTCs the Executive Council requests the EC Panel of Experts on Education and Training to provide EC-LXIII advice on the progress of the RTCs in meeting these corrective actions.
### Annex VII – RTC External Assessment Programme

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<th>Convenor</th>
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<td>Uzbekistan</td>
<td>Lisk</td>
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<td></td>
<td>India</td>
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<td>2011</td>
<td>China</td>
<td>Castro</td>
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<td>Turkey</td>
<td>Lisk</td>
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<td>Russian Fed.</td>
<td>Necco</td>
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<td>2012</td>
<td>Italy</td>
<td>Johnson</td>
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<td>Venezuela</td>
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<td>Angola</td>
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<td>2014</td>
<td>Brazil</td>
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<td>Islamic Rep. of Iran</td>
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<td>2015</td>
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<td>Iraq</td>
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## Annex VIII- Current WMO RTCs

### AGREEMENTS BETWEEN WMO AND MEMBERS HOSTING RECOGNIZED RTCs

<table>
<thead>
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<th>Copies Available on File</th>
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<td>RTC Belem, Brazil</td>
<td>13 July 1984</td>
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<td>4</td>
<td>RTC China *</td>
<td>14 June 1984</td>
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<td>5</td>
<td>RTC Egypt</td>
<td>12 June 2009</td>
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<td>RTC India *</td>
<td>15 June 1988</td>
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<td>7</td>
<td>RTC Islamic Republic of Iran</td>
<td>14 June 1994</td>
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<td>RTC Israel</td>
<td>26 April 1995</td>
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<td>RTC Italy *</td>
<td>23 Feb. 1984</td>
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<td>10</td>
<td>RTC Madagascar</td>
<td>21 June 1984</td>
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<td>11</td>
<td>RTC Russia *</td>
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<td>12</td>
<td>RTC Turkey</td>
<td>18 May 2000</td>
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<td>13</td>
<td>RTC Uzbekistan</td>
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### Copies Not Available on File

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<th>RTC Algeria</th>
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<td>2</td>
<td>RTC Kenya *</td>
<td>1967</td>
</tr>
<tr>
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<td>1975</td>
</tr>
<tr>
<td>4</td>
<td>RTC Nigeria *</td>
<td>1967</td>
</tr>
<tr>
<td>5</td>
<td>RTC Iraq</td>
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<td>6</td>
<td>RTC Argentina *</td>
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</tr>
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<td>7</td>
<td>RTC Venezuela</td>
<td>1975</td>
</tr>
<tr>
<td>8</td>
<td>RTC Costa Rica</td>
<td>1968</td>
</tr>
<tr>
<td>9</td>
<td>RTC Philippines *</td>
<td>1978</td>
</tr>
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* With University component
** Two Technical components
### Annex IX ETR Symposium

Draft program for the eleventh WMO Education and Training Symposium

**New Approaches to the Education and Training for Meteorological and Hydrological Forecasters**

25 to 29 October 2010, Citeko Indonesia

<table>
<thead>
<tr>
<th>Monday 25</th>
<th>Tuesday 26</th>
<th>Wednesday 27</th>
<th>Thursday 28</th>
<th>Friday 29</th>
<th>Saturday 30</th>
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</thead>
<tbody>
<tr>
<td>0900 – 1030</td>
<td>Opening Ceremony</td>
<td>Theme 2 Competencies and qualifications - key note</td>
<td>Theme 3 Role of national and regional training institutions</td>
<td>Reports from Working Groups with general discussion and summary</td>
<td>RTC Directors Meeting</td>
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<tr>
<td></td>
<td>Country Speakers</td>
<td>Allow presentations on training and assessment methods</td>
<td>Include how do we fund training – business cases</td>
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<tr>
<td></td>
<td>WMO President or SG</td>
<td>WMO 258</td>
<td></td>
<td>Closing ceremony</td>
<td></td>
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<td></td>
<td>D/ETR Group Photograph</td>
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<tr>
<td>1100 – 1230</td>
<td>Theme 1 ETR Challenges for the next decade (WMO President or SG) key note</td>
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<tr>
<td>1400 – 1530</td>
<td>Weather Hydrology Climate DRR / Early Warning Observations Forecasting and communications HRD Aviation School and popular education</td>
<td>Include how do we train and certify the trainers</td>
<td>Working Groups on the themes</td>
<td>SCHOTI meeting</td>
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<tr>
<td>1600 – 1730</td>
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<td>Local site visit</td>
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Annex X - Actions from the XXIVth EC Panel of Experts on Education and Training Session

Key Performance Indicators

The Panel recommended the following Key Performance Indicators

- The number of RTCs providing education and training support for GFCS related activities
- The degree to which Members are getting value for money\(^2\) from the WMO Fellowship Programme.
- The degree to which the RTCs support the regional training demands in particular for students from developing and least developed countries

The Panel voiced its concern about the lack of opportunity to have input into the KOs and KPIs at an earlier stage. It requested the Chair of the Panel to provide the EC WG on Strategic and Operational Plans with the feedback from the Panel at its next session in the week of 29 March to 1 April 2010.

EC PANEL OF EXPERTS ON EDUCATION AND TRAINING TERMS OF REFERENCE

The Executive Council, at its sixty-third session (2011) decided (EC-LXIII, Resolution XX) “to maintain the Executive Council Panel of Experts on Education and Training to serve as an advisory body on all aspects of technical and scientific education and training in meteorology and operational hydrology with the following terms of reference:

- To promote and provide guidance on the education and training of personnel of Members, particularly in developing and least developed countries;
- To liaise with and respond to the WMO regional associations and technical commissions in the field of education and training within their respective areas of responsibility;
- To review the priorities and direction of the education and training activities undertaken by the Secretariat;
- To review the fellowships programme, providing guidance and advice on actions aimed at strengthening the programme and its effectiveness;
- To contribute to the preparation of the 2015 to 2019 WMO Strategic and Operational Plan by providing input, comments and recommendations with regard to the Capacity Building parts of the Plans;
- To recommend suitable WMO symposia, courses, workshops, seminars and distance learning opportunities;
- To advise on actions for strengthening the existing RTC network and for monitoring their activities as well as the designation of suitable training institutions as WMO RTCS and encourage NMHS training centres to utilize the EC Criteria for RTCs in monitoring the quality of their programmes;
- To advise on and promote training resources and methodologies suitable for use by WMO RTCs, NMHSs and other training institutions;

\(^2\) Synthesis of indicators such as: number of fellows still working in the service two years after completion; change in level of responsibility; change in type, quality or quantity of services provided by NMHS...
• To collaborate with internationally-orientated education and training bodies in meteorology, hydrology and related fields;
• To consider any other matters relating to education and training which the Executive Council may specifically request”.

The Panel recommended that the Executive Council should continue the current practice of selecting Panel members who were actively involved in education and training in meteorology and hydrology. The Panel considered the composition and number of the Panel for the next financial period. The current number of members was seen to be a realistic balance of regional and language coverage as well as representation from CHy and should be continued if possible. If the budget continued at Zero Nominal Growth without supplementary resources, the Executive Council may have to consider reducing the number of members with a subsequent decrease in effectiveness of the Panel. Any savings should be retained in the ETR Programme.

Liaison with Technical Commissions and Regional Associations

The Panel requested the Secretary-General to write to each of the Regional Association and Technical Commission presidents asking them to nominate an appropriate contact point for the Panel, and its members, to seek or receive information on education and training matters from the Region or Technical Commission. Noting that a number of the Technical Commission vice presidents were tasked with education and training responsibilities the Panel indicated that the Vice Presidents of the regional associations and Technical Commissions would make excellent focal points.

WMO 258

The Panel considered all these issues and came to the following conclusions about the follow-up to the 4th edition of WMO No. 258.

• The requirements to be specified as a Meteorologist or Meteorological Technician should be only in terms of successful completion of the necessary courses of study for Meteorologists and Meteorological Technician (both the requisite and mandatory components). Annex III – DRAFT RESOLUTION FOR EC – LXII contains a draft resolution for EC to consider for recommendation to Congress XVI (Cg-XVI).
• Within the follow-up to the 4th edition of WMO Publication No. 258 there should be no links between categories of personnel (in terms of the WMO classification) and jobs. It should be for NMHSs and international regulatory agencies to decide what categories of staff should fill particular jobs.
• There should be a clear distinction between the educational requirements for categories of personnel and competency requirements for particular jobs.
• The specifications of the courses of study (including requisite requirements) should be more detailed than at present and they should be put in terms of learning outcomes. The learning outcomes should be critically reviewed during the preparation process to ensure that their level, definition and scope are appropriate.
• In the follow-up to the 4th edition of WMO Publication No 258 no distinction should be made between the full and condensed versions of the BIPs as the learning outcomes in both cases are the same.
The specifications of the courses of study should be limited to requisite and mandatory components. Consequently the references to details about the existing optional components (i.e. “elective fields of specialization in meteorology”, “other fields of specialization” and “elective options in operational meteorology”) should be removed.

The requisite requirements for the courses of study should be amended:

1. For Meteorologists, the chemistry requirements should be removed (except for basic physical chemistry), as should the requirement for “international communication languages”. In addition “information and communication technology” should be treated as part of complementary requirements rather than as part of mathematics.

2. For Meteorological Technicians, the chemistry requirements should be removed as should “introductory differential and integral calculus”. In addition “introduction to communication technology” should be retained, but not be considered as part of mathematics.

The follow-up to the 4th edition of WMO Publication No. 258 should be produced in three parts.

1. A publication that defines the categories of personnel and specifies the associated required courses of study. This could be considered as a successor to WMO No. 258 or treated as a new top-level mandatory publication. It would be appropriate for the title of the publication to clearly reflect its content.

2. A publication aimed at providing guidance to professionals involved in delivering education and training. This could include topics such as instructor competency requirements, the education and training process (including instructional methods, aspects of distance learning, needs analysis, planning, delivery, assessment and the development of public education and outreach programmes), and the process for developing job competencies and how such competencies can be assessed. This publication would be “owned” by the EC Panel of Experts on Education and Training and would not be a mandatory publication.

3. The specification of job competencies in publications prepared by bodies that have responsibility for specific areas of activity. For example, the detailed competencies for Aeronautical Meteorological Forecasters and Aeronautical Meteorological Observers would appear in a CAeM publication.

The Panel formed an Editorial Task Force for the publication to replace the 4th edition of WMO Publication 258. The first part of replacement publication should be ready for review by Cg-XVI. The second part should follow as soon afterwards as possible. The Editorial Task Force is composed of Mr Chris Webster, Mr LeRoy Spayd, the ETR Office and invited experts. The Editorial Task Force will call upon the Panel members to review the work, particularly in terms of language.

ETR Status Report

The Panel decided that, rather than relying solely on a survey every four years, the ETR Office should prepare a status report on at least a four yearly basis, including the information gathered from a survey and other sources, on Members training requirements, opportunities and capabilities. Noting the typical budget and planning cycle the Panel decided that, in order for it to be fully able to undertake its role of advising Executive Council and Congress on the WMO
Education and Training Programme (ETRP) it would be more effective to carry out following sequence of activities during a financial period.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Notional year</th>
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<tbody>
<tr>
<td>ETR conduct trial survey and prepare report</td>
<td>2011</td>
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<tr>
<td>First Panel session</td>
<td>2012</td>
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<tr>
<td>ETR conduct survey and prepare status report</td>
<td>2013</td>
</tr>
<tr>
<td>ETR Symposium held providing review of past work and options for future work</td>
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<tr>
<td>Second Panel Session to review plans for next financial period</td>
<td>2014</td>
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<tr>
<td>EC provide guidance on budget for next financial period</td>
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<tr>
<td>Congress approve plans and budget for next financial period</td>
<td>2015</td>
</tr>
<tr>
<td>First Panel Session</td>
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<tr>
<td>ETR conduct survey and prepare status report</td>
<td>2016</td>
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<tr>
<td>ETR Symposium held</td>
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The Panel suggested that the Executive Council request the Secretary-General to consider selecting and contacting a small group of representative Member states to seek their agreement to participate in an ongoing longitudinal survey. The number and selection of the members would have to be such to allow meaningful conclusions on the wider population to be drawn. The Panel also recommended that alternative data sources such as data and information from COMET, EUMETCAL, CALMET and the Virtual Laboratory be used in the assessment of the use of computer and distance learning and other learning methods.

**RTCS**
The Panel considered the criteria for the establishment and reconfirmation of WMO Regional Training Centres. The existing criteria primarily focus on what is needed to become a WMO RTC but are relatively silent about criteria for reconfirmation. Concerns were expressed that some RTCs seeking reconfirmation might not qualify to be established but could in fact be reconfirmed. The Panel has recommended to EC that the eight year external review cycle include criteria similar to those applied when the RTC was originally proposed. The new criteria are presented in Annex IV–EC Criteria for the recognition and reconfirmation of Regional Training Centres and Annex V - Processing steps for Reconfirmation of RTCs.

Following a detailed examination and discussion of each of the external assessment reports, and the attendant documentation, the Panel recommended the immediate reconfirmation of the RTCs of Argentina, Barbados, Costa Rica, and Kenya. For the RTCs in Egypt and Madagascar the Panel has recommended a delay in reconfirming their RTC status. For Egypt this is to provide them time to implement the arrangements with the University of Cairo.
that will better enable them to demonstrate the level of their course work and assessment procedures for international students, for Madagascar it will provide time for them improve their planning and coordination, liaison between the various components of the RTC and with WMO and, further develop the skills of their teaching staff and resources. The Panel noted and applauded the coordination that the RTC in Egypt is undertaking with the RTC in Nanjing and the development of links with the University of Cairo. The Panel anticipates that as these actions are implemented they will overcome the concerns about the assessment process for international students evident in the external assessment report. Similarly, the Panel noted and appreciated the willingness of the RTC in Madagascar to implement all of the recommendations in the external assessment report. Noting the direction of EC-LVIII which requested that the EC Criteria be strictly applied when assessing new RTCs or reconfirming existing RTCs the Panel was obliged to recommend a delay in reconfirming the RTC status in these two cases. The Panel requested Executive Council to ask the Secretary-General to assist these two RTCs within the limits of available resources. Annex VI - DRAFT RECOMMENDATION 4/1 (PAN-XXIV) - RECONFIRMATION OF RTCs ASSESSED DURING 2008-2009

The Panel noted a proposal by Mr Kent Johnson of Canada to standardize the format and process of RTC external reviews and endorsed his proposal. The report shall include statements about the degree to which the RTC meets the individual criteria required of RTCs to be reconfirmed. The Secretariat is requested to create a guideline and suggested format for all RTC external reviews used in the reconfirmation process.

The Panel noted four pending proposals for the creation of new WMO Regional Training Centres in Qatar, Peru, South Africa, and Indonesia. Since the application of Qatar is complete, the Panel recommends that the EC approve the Qatar application pending a site visit by a representative of the Secretary General.

In the cases of Peru and South Africa the feedback from the Regional Associations through their Presidents and a visit of the representative of the Secretary-General are pending before the Panel can consider the proposal. For Indonesia a formal request, feedback from the Regional Association through the President and a visit of the representative of the Secretary-General are pending before the Panel can consider the proposal.

The Panel noted that this is the last Panel and EC session before the 16th WMO Congress in May 2011 and requested EC to allow these proposals to be presented to Congress for its consideration if they have completed all the formal steps prior to May 2011.

TT - AFQ

Noting the recent decision by the Commission for Aeronautical Meteorology to form a Task Team on Competency Assessment Toolkit (TT-CAT, see agenda 5.4 for this session) and the links between that Task Team and the Panel, the Panel recommended the dissolution of the TT-AFQ. The Chair of the Panel thanked the TT-AFQ and its Chair, Mr Ian Lisk, for their extremely useful work and response to the challenges set by the Panel and EC-LXI.
TT-DOL

The Panel concluded that the best way to meet the Members need for a cost-effective online programme that met BIP-M requirements would be for interested Members to create a consortium to develop, test, implement and maintain such a program. This would not have to be a full graduate programme but it would need to meet the requirements of the BIP-M and specialize in the knowledge requirements for operational meteorology.

As a strategy to enhance the availability of online undergraduate courses and degree programs in meteorology the TT-DOL suggested that the Panel could assist Members by:

- Promoting more virtual communities using as a model the WMO Virtual Laboratory for Satellite Education;
- Enhancing the current online training calendar to become a global calendar of training events;
- Increasing assistance to Members, in particular RTCs, in developing their staff to create and deliver online learning; and
- Maintaining the TT-DOL from the last Session to continue work on enhancing Distance and Online Learning in WMO

Next Session
The Panel agreed that its next session be organized in the first quarter of 2012. The Panel noted with appreciation the offer from Mr C. Webster on behalf of the Met Service of New Zealand to host the next meeting in Wellington, New Zealand.

Familiarisation Visits
Panel members noted that, whilst familiarization visits are of benefit to the PRs, the WMO Secretariat and to the host countries they constitute direct costs to the fellowship funds. After extensive discussion the Panel recommended that, if Congress set another ZNG budget, funds provided for the ETRP should not be used for familiarization visits.

Fellowship Manual
Noting the comments from the draft evaluation report on flaws in the design of the fellow feedback reports and the reports from the ETR Office regarding the Fellowship Nomination Forms and interpretation of sections of the Fellowship Manual the Panel recommended a review and update of the Fellowship Manual. The Panel anticipated that major changes would not be required but it will take some time to document and review the current Manual and prepare new forms with editable online versions to improve readability and response rates.

Fellowships
The Panel encouraged the Secretary-General to seek expressions of interest from personnel in universities in the developed countries for sabbaticals in the RTCs to provide specialist courses and work with the RTC staff to revamp courses or create new courses in areas such as the socio-economic impacts of meteorological services (this would partially address one of the recommendations from the 2007 Madrid Conference). The Panel also noted that it may be possible to request funds from VCP (F) for such purposes.

The Panel requested Executive Council to remind Permanent Representatives that Fellowships could be awarded to personnel not employed by NMHSs. For some countries this may improve the pool of qualified and skilled staff suitable for recruitment to NMHSs and in other cases could improve the staff in education and training institutions.

School and Popular Education

The Panel congratulated Dr Geary and the GLOBE program on this innovative program and recommended that the Secretary-General write to all PRs advising them of the program and encouraging them to contact their national GLOBE Country Coordinators to identify opportunities for the NMHSs to support the SCRC. Noting the role that WMO could play in the SCRC within the framework of the agreed TOR, the required actions would also further develop and implement the WMO school and public environmental education programme at the national and regional level during the next Financial Period.

The Panel proposed to the Executive Council to express its opinion on School and Popular Education as it is of global interest for subsequent consideration by Congress Cg-XVI.

WMO ETR Symposium

The Panel established an International Program Committee consisting of (Kent Johnson (Chair), Vilma Castro, LeRoy Spayd and Pat Parrish) to assist the ETR Office in developing the program, suggesting key note speakers, selecting papers and seeking support for NMHS and RTC staff to participate in the Symposium. The Panel requested the ETR Office to work with the Chair of the Programme Committee to include someone from the host country and one or two other members to provide a balanced coverage. A draft copy of the Symposium program is at Annex IX ETR Symposium

ETR Budget for the next Financial Period

If the ZNG is adopted the Panel requested the Executive Council to seek additional means of increasing the budget to this vibrant and cross-cutting programme to the same level as the 15th to allow the ETRP to meet the priorities for the 16th Financial Period.