

**WORLD METEOROLOGICAL ORGANIZATION**

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**EXECUTIVE COUNCIL  
PANEL OF EXPERTS ON EDUCATION AND TRAINING**

**TWENTY-SIXTH SESSION**

**Seoul, Korea**

**24 – 28 MARCH 2014**

Draft  
**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-sixth session of the WMO Executive Council Panel of Experts on Education and Training (the Panel) was held in Seoul, Republic of Korea, from 24 to 28 March 2014.

The Panel addressed a number of topical and difficult issues related to the future roles and operations of WMO Regional Training Centres (RTCs), a proposal to expand and enhance education and training opportunities for Members through a framework known as the WMO Global Campus, the status of the RTCs in Israel and Italy, the Terms of Reference for the Panel for the next financial period, and the strategy being followed in the ETR Office to increase the number and partners providing fellowship opportunities for WMO Members.

At a strategic level the Panel recommended that the WMO Executive Council (EC) endorse a feasibility study of the WMO Global Campus concept. This study would enable a more complete proposal to be considered by the seventeenth WMO Congress in May 2015. The Panel considers the Global Campus has the potential to significantly improve access to education and training opportunities and resources by Members, particularly those from developing and least developed countries and small island developing states. The Global Campus is expected to i) build upon and extend the best elements of the RTCs and ii) provide a framework to engage with new providers of education and training to support the needs of WMO Members and to address primarily those areas that the RTCs are currently unable to support.

At a tactical level the Panel has recommended that EC:

- Strengthen the overall value of the RTC designation and specifically enhance the value of RTCs to their regional association through improvements in the EC Criteria for the recognition and reconfirmation of RTCs, including identifying the roles and responsibilities of the parties involved in the RTC;
- Extend and formalize the gathering of information related to Member staffing needs, profiles and capabilities to better understand the future demands upon the Education and Training Programme (ETRP);
- Update the EC criteria for the award of WMO Fellowships;
- Approve the revised Terms of Reference for the Panel, including a more open and transparent selection process;
- Endorse the Panel's proposed role to act as a review body for the competency standards developed within the Technical Commissions to ensure consistency in language and approach.

At an operational level the Panel has recommended that EC:

- Reconfirm the Bet-Dagan Institute in Israel as an RTC;
- Defer reconfirmation of IBIMET in Italy as an RTC for two years when EC-68 will reassess its status based on the progress made in contributing to the WMO ETRP;
- Update the EC Criteria for the award of Fellowships.

The Panel agreed on a work plan for the next inter-sessional period including the review schedule for RTCs for 2014 and 2015.

These decisions are expected to assist Members by:

- Providing better monitoring of progress and increased focus for the ETRP;
- Enhancing the networking of Regional Training Centres;
- Promoting and applying distance learning to address needs of Members;
- Fostering the further development of national training programmes;
- Enhancing the capacity of Members through increased fellowship opportunities;
- Ensuring that decisions on education and training activities and approaches are aligned with existing and emerging Members' ETR needs.



**Figure 1. Members of the Twenty-sixth Session of the Executive Council Panel of Experts on Education and Training**

Back row: (L – R) Dr B. Mukhopadhyay, Dr R.Riddaway, Dr P. Parrish, Mr D.Reboux, Dr B.Sarr, Dr T.Spangler, Mr C. Webster, Mr K. Johnson, Ms A. Semple  
Front row: (L – R) Mr J. Wilson, Dr W. Jordaan, Mr I. Lisk, Dr D. Grimes (Chair), Dr Y. Kwo (KMA Administrator), Ms N. Alegre, Ms M.Wang, Dr V.Castro

Unable to attend Session: Ms C. Competella, Mr F. Lalaurette

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## GENERAL SUMMARY OF THE WORK OF THE SESSION

### 1 ORGANIZATION OF THE SESSION

#### 1.1 Opening of the Session

The twenty-sixth session of the Executive Council Panel of Experts on Education and Training (PAN-26) was held in Seoul, Republic of Korea, from 24 to 28 March 2014. The President of WMO and Chair of the Panel, Dr David Grimes, opened the session at 0930 on Monday, 24 March 2014. In his opening remarks Dr Grimes thanked Dr Yun-kwa Ko, Administrator of the Korean Meteorological Administration (KMA), for offering to host this session, and the staff of KMA for the excellent arrangements and support to the session. The Chair remarked that Korea has a long and proud history of taking meteorological observations and KMA is an active and forward looking NMHS. The Chair noted that, due to the cross cutting nature of the Education and Training Programme (ETRP) and its importance to all Members, particularly the developing and least developed countries, it has been traditional for the WMO President to Chair the Panel. The Chair stated that he was pleased and proud to carry on with this tradition.

The Chair stated that the EC Panel of Experts on Education and Training (hereafter referred to as the Panel) is one of WMO's more active and influential groups. Its work is well regarded by the Executive Council, Congress and Members. The Panel is successful because of the efforts of individuals, and the organizations supporting them, in carrying out the work of the Panel. He thanked the Panel members for their dedication and requested them to convey his thanks to their organizations.

The Chair acknowledged the work of Dr "Bob" Riddaway and his team for their work in proposing new ideas for the "Future Roles and Operations of WMO Regional Training Centres". RTCs are particularly sensitive institutions in WMO and the Chair noted that Dr Riddaway and his team had worked hard to ensure that a positive and inclusive approach was pursued in this task.

The Chair also acknowledged Dr Riddaway's volunteer work to assist the ETR Office in pulling together and editing a number of ETR publications over the last four years. Without the efforts of people like him, the work of this Panel and the wider ETRP would not be as successful as it is. Dr Grimes also noted that this session of the Panel will most likely be the last one supported by Ms Nelle Alegre, Administrative Assistant to the Director of the Education and Training Office. Ms Alegre is well known not only to Panel members but to EC and Congress as an enthusiastic, dedicated and competent WMO staff member. Her services to the Panel and the wider ETR community are well known and greatly appreciated.

The Chair noted that this was the last session of the Panel prior to the Seventeenth World Meteorological Congress in 2015. Over the last six years the Panel had tackled a range of issues including qualifications and competencies for meteorological personnel, competencies for education and training providers, and learning outcomes for meteorologists and meteorological technicians. These issues have been tackled within the framework of the WMO Technical Regulations and are all designed to assist Members address their education and training needs which are directly linked to enhancing the quality and breadth of services provision.

The Chair noted that during this session the Panel would have a joint meeting with the Informal Planning Meeting for the Voluntary Cooperation Programme (IPM-VCP) to examine possible avenues for further collaboration.

Dr Yun-Hwa Ko, Administrator for the Korean Meteorological Administration,(KMA) welcomed members to KMA headquarters and noted KMA's long-term interest in education and training, particularly by assisting NMHSs from developing and least developed countries. Dr Yun-Hwa noted KMA's strong interest in having the KMA training facilities recognized as a WMO RTC. He noted that this recognition would allow KMA to provide even more support to the international community than at present.

The Chair noted that this is the 26th session of the Panel; the first Panel meeting was held in Geneva in 1966. The next scheduled session of the Panel is in 2016 and it will occur 50 years after the Panel first met. The Chair suggested this would provide an excellent opportunity to reflect on the successes and challenges over five decades for a publication such as the WMO Bulletin. (Action 1)

Mr. Jeff Wilson, Director of the WMO Education and Training Office, acknowledged the key role KMA had played in the Panel over the last eight years and thanked Dr Yun-Hwa Ko for the friendly and helpful assistance that the staff from KMA had provided to the ETR Office in the preparation for this session. Mr Wilson also thanked the Panel members for their contribution towards preparing documents for the session, in leading the RTC assessment visits and input on a range of matters since the last session of the Panel. Mr Wilson expressed his gratitude to the Panel members for their contribution to the various Panel tasks over the last two years that led to the acceptance of the draft trainer competencies into the WMO Technical Regulations, publication of a new trainers' guide, and a review of the future roles and operations of WMO RTCs.

## **1.2 Adoption of the Agenda**

The provisional agenda was adopted by the session with some amendments, and is reproduced in Annex I. Annex II lists the participants in the session.

## **1.3 Programme of Work**

The Chair proposed that the working hours would be from 08:30 up to 12:30 and from 13:30 to 17:00 with breaks as appropriate. The Chair suggested that the Panel would review the papers prepared for the session in plenary and then create working groups to consider the major issues in detail as required.

# **2. MAJOR OUTCOMES FROM EXECUTIVE COUNCIL-64 and 65**

## **2.1 Background**

The Panel was advised about the wide range of decisions and discussions on matters related to the ETRP within Executive Council, the Regional Associations, the Technical Commissions, and a number of EC working groups. The items were grouped into matters on governance and current and future requirements.

## **2.2 Matters related to governance and operation of the ETRP**

The Panel reviewed the decisions related to:

- Confirmation of RTCs – noting that the RTC in Uzbekistan had two foreign students and thus had met the EC requirement for their reconfirmation;
- EC-64 support for the recommendation from the Panel that training institutions should follow ISO 29990:2010(E) – 'Learning Services for non-formal Education and



Training–Basic Requirements for Service Providers,’ if not accredited nationally or by another mechanism;

- EC-65 support for the Panel’s recommendation for familiarization visits to not exceed 10% of the Fellowship Programme Regular Budget (this was the case in 2013).
- Proposals for new Terms of Reference for Regional Associations that would include activities related to the gathering of information on the education and training needs of Members;
- The low return rate of questionnaires from the countries for which information is most sought. Whilst considering an approach of withholding fellowship awards until the key questionnaires were provided had some attraction, the Chair noted that this approach was generally not successful and it is better to look at other options such as personal contact with the PRs or Directors of the Meteorological Services.

### **2.3 Matters related to identification of current and future requirements**

Items under this heading can be further grouped into eight areas.

#### Development of Competency standards

The Panel noted the need to continue the interaction with the technical commissions and assist them in the widespread dissemination of the draft competencies within the WMO ETR community. This would ensure thorough and meaningful decisions when the technical commissions consider them for possible adoption into the WMO Technical Regulations.

The Panel also noted that the “Competency Requirements for Education and Training Providers for Meteorological, Hydrological, and Climate Services” had been approved by Members for inclusion in the WMO Technical Regulations as Recommended Practices. This will be reflected in the next version of the Technical Regulations to be published after EC-66.

#### Climate Services

The Panel noted that the implications for the ETRP from the implementation of the GFCS are potentially significant but at this stage still somewhat unknown as the science and the services are still being developed. It is anticipated that there will be increased education and training requirements for NMHS personnel involved in the production, delivery and interpretation of the new and upgraded climate services products and information using the draft Climate Service competency standards. It is also likely that there would be some requirement for education and training activities to support users in the application of climate services and products.

#### Education and training in hydrology

The Panel noted with pleasure that CHy-14 had acted on the request and recommendation of Cg-XVI by establishing a joint Task Team with UNESCO, IAHS and IAHR to develop an agreed global understanding of the definition of hydrologist and hydrological technicians and to develop competency requirements for hydrological personnel.

#### Aeronautical Meteorology

The Panel noted EC’s request to the Panel to coordinate with CAEM, the RTC network and others as appropriate to develop mechanisms, in line with QMS principles, to support the training, education and ‘best practices’ in the competency assessment of aeronautical meteorology personnel. The changes proposed by ICAO for block management are expected to affect all meteorological service providers over the next 15 years and could dramatically change the role and tasks of an Aeronautical Meteorological Forecaster.

### QMS and Service Delivery

The Panel noted that activities carried out under the ETRP are a service to Members. RTCs and other partners providing education and training services will be expected to conform with this approved WMO strategy.

### Disaster Risk Reduction

The Panel noted that in coordination with the ETR Office, the DRR Office anticipate requesting expressions of interest from RTCs to further develop and deliver outward looking DRR training programmes.

### Space Weather

The Panel was advised that WMO Members would be expected to provide services for space weather by late 2016. The US NWS has created an online module to assist in the training.

### Emerging demands

The Panel noted the comments from RA II, IV and VI on emerging demands such as:

- Coping with issues related to the economic conditions and lack of resources that are affecting the performance of NMHSs including constant pressure for budget and staff cuts, insufficient qualified personnel, and difficulties to maintain and sustain basic functions;
- Enhancement of Climate Services: implementation of GFCS at regional and national level;
- Implementation of WIGOS and WIS (noting that WIS has already been implemented);
- Enhancement of Services: PWS, DRR/EWS, aviation and related services as well concrete and urgent needs related to maintaining and improving the observing systems and the quality of observations, and demonstration and communication of the resulting social and economic benefits;
- Provision of services to megacities as the majority of the world's population become increasingly urban dwellers.

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

### **3.1 Role of the EC Panel of Experts on Education and Training**

The Panel discussed its role in providing advice and recommendations to EC related to the governance and standards, future directions and implementation of activities associated with the WMO ETRP. The Panel noted that i) in recognition of the importance of the cross cutting and supporting role of the ETRP with the other WMO Programmes, ii) relevance of its contribution to the capacity development activities of Members, particularly those from developing and least developed countries, and iii) to provide a strong voice within the WMO Executive Council, it has been customary since 1971 for the Panel to be chaired by the President of WMO. The Panel recommended that this should continue.

### **3.2 Terms of Reference of the EC Panel of Experts on ETR**

The Panel reviewed its terms of reference for the current financial period and updated them in light of the evolving requirements. To improve the openness and transparency of how Panel members are selected, the Panel recommended a new process for nomination and selection that would maintain the focus on education and training expertise and assist EC in dealing with changes in the Panel's membership during the financial period. The new ToRs are in [Annex III](#).

### **3.3 ETRP Programme Description**

The Panel recalled that the Seventeenth World Meteorological Congress will consider progress and provide direction to the WMO ETRP. The Panel discussed the ETRP description from the Sixteenth World Meteorological Congress and provided an update for presentation to Congress in May 2015; this is at [Annex IV](#).

### **3.4 Key performance indicators**

The Panel reviewed the KPIs for the current financial period noting the report presented to the EC WG on SOP in February 2014. Close examination of the source data from the 2013 survey identified that anomalous responses to the fellowship question resulted in the skewed response in comparison to 2012; when these anomalous responses were removed the 2013 result was similar to 2012. The Panel noted the consistent poor appraisal of RTCs in RA III.

The Panel noted that the current three KPIs were suggested in 2010 as a way of monitoring the success of the ETRP in terms of key training providers, fellowships as a major capacity development activity, and the ability of the programme to respond to new requirements. Recognizing that the question of compliance was becoming increasingly important for Members, the Panel recommended updating the KPIs for the next financial period to the following:

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*i) Percentage of Members accessing training which satisfies the Basic Instruction Package(s) requirements;*

*ii) Percentage of Members offering training which satisfies the Basic Instruction Package(s) requirements;*

*iii) Percentage of Members accessing training that supports their implementation of the aeronautical meteorology personnel competency (2013) Standards.;*

The Panel recognized that whilst the proposed KPIs would help monitor the key issues related to access and use of ETR in compliance areas, the data would only be useful if the majority of Members responded to requests for information. The Panel therefore urged the regional associations to help ensure that high response rates from Members were achieved in future, particularly for Members from developing and least developed countries. The Panel noted that the wording of questionnaires and identification of other data sources that would be used to monitor the KPIs could be left to the Secretariat provided the overall thrust of the proposed KPIs was kept.

## **4. IDENTIFICATION OF WMO HUMAN RESOURCE DEVELOPMENT REQUIREMENTS**

### **4.1 The WMO Fellowship Programme**

The Panel recognized that the WMO fellowship programme continues to evolve in order to better meet the changing needs of WMO Members. Over the last five years new partnerships have been created, existing partnerships strengthened, award processes streamlined, fellowship opportunities better aligned with the WMO high priority areas, and more attention given to support for the fellows before, during and after they undertake the fellowship. In addition, new funding sources have been developed as a result of actions from the Resource Mobilisation and Development Partnership Office.

In promoting research and training in meteorology, the Panel recalled that WMO has accorded a high level of importance to education and training through its fellowship scheme. The WMO Regular Budget has been the primary source of fellowship funds but these funds are complemented by considerable in-kind resources from partners. Partner

contributions are typically a waiver or reduction of tuition fees and/or other support for the fellows through accommodation, work experience etc. The Panel recognized that the WMO Fellowships Division of the ETR Office (FEL), through a concerted effort to reach out to partners, and as a result of increased confidence in the work of WMO, has been possible to leverage more bilateral resources for funding of fellowships activities in least developed and developing countries. The support not only increases the number of fellowships awarded, but very importantly contributes to the diversity of courses on offer, and promotes gender equality. The Panel noted that it had been possible to maintain approximately the same number of long-term fellowships on a year by year basis using the measures above, even though costs have increased, and budgets have been reasonably constant. [Annex V](#) provides details of the 2012 and 2013 fellowship activities whilst [Annex VI](#) provides details of some of the revised and new arrangements.

#### Targeted group training to enhance Member expertise in WMO High Priority areas

The Panel noted that the Resource Mobilisation and Development Partnership Office has facilitated new project based sources of extra budgetary funding for education and training. Recalling the education and training gaps in a number of the high priority areas that have been difficult to address with Regular Budget funds, the need for visibility of the donors, and transparency in how the funds are utilized, the Panel supported the following approaches for use of these additional funds: group training addressing one or more of the high priority areas consistent with the donor requirements, long-term fellowship support to complement existing regular budget funds, and promotion and support of on-the-job training opportunities to assist other parts of the same projects.

The Panel acknowledged that short-term group fellowships will allow WMO to address human resources needs for many experts whilst at the same time creating opportunities for the participants to expand their individual networks. The Panel acknowledged that host institutions are also given the opportunity to enhance their training through collaboration with other partners. The Panel agreed that group training of several weeks to a month allows trainees to develop and consolidate the new knowledge and skills to a greater degree than a one week workshop. At the same time the NMHSs would not have to release their staff from duties for a long period.

#### Strengthening Job Related Skills Through Targeted Fellowship Opportunities

The Panel recalled that education and training opportunities within WMO can be grouped on three time domains:

- i) very short term – opportunities of one month or less are typically workshops and training events;
- ii) short term – opportunities of more than a month and up to six months, typically on-the-job training and secondments;
- iii) long-term – opportunities of more than six months typically courses at Universities or similar that provide an academic qualification.

The Panel noted that some Members have taken advantage of the opportunity for short-term or on-the-job training of their personnel hosted by other NMHSs but in general this opportunity is under-utilized by Members. Those areas best addressed by on-the-job training include specialized topics that require regular retooling of expertise or competencies. Examples include enhancement of competencies in the area of data management, numerical weather prediction, and instruments and calibration. The Panel recalled that information about opportunities to undertake this style of training is provided within the annual circular letter and via face-to-face discussions during familiarization visits by new Permanent Representatives. The Panel also noted that experts could be sent to a RTC as part of an exchange programme to disseminate knowledge in the host institution and gain new knowledge for use in the home country.

The Panel noted that, within the financial constraints currently set by EC for VCP

funds, it could be possible to support between six and ten fellows a year for on-the-job training depending upon duration and cost of living. The Panel agreed that for this training to be effective Members with relatively developed NMHSs would need to indicate their willingness and ability to provide a structured programme as well as mentor and support fellows from less developed NMHSs. The Panel stated that in the interests of access and transparency it would be advisable to advertise these opportunities rather than deal with ad-hoc requests. The Panel suggested that Members hosting regional or global centres could offer on-the-job training in keeping with their obligations as such centres. The Panel recalled the Desk Program coordinated and funded through the US NWS VCP activities was a good example of this type of training.

### Streamlining The Award Process

The Panel were advised that a number of steps have been taken to increase the transparency and efficiency of the fellowship selection and implementation process.

The first step was the creation of an annual compendium of information on the fellowships opportunities. The Panel recalled that the Secretary-General advises Permanent Representatives of these opportunities in the last quarter of each calendar year. In addition to the annual circular letter, other opportunities are also circulated to Members as they arise in the interests of transparency and to allow equal opportunities in the selection process.

The second step has been to provide more objectivity and repeatability in the application of the criteria for the award of WMO fellowships which were set by the WMO Executive Council (EC-LVIII, June 2006). The Fellowship Committee (FELCOM) is now provided with an evaluation table of candidates for the various awards that is objectively based upon the selection criteria. The table consists of weighted points for the EC criteria, and it serves as a basis for ranking and preparing a shortlist among competing candidates for fuller FELCOM consideration. The Panel reviewed the 2006 Criteria and recommended updates to EC-66 ([Annex VII](#)).

The third step was creation of a new publication for PRs and prospective fellows, WMO No 1104 "Guidelines for Applying for a WMO Fellowship"; this has been produced in English, French, Russian and Spanish and published in 2013.

The Panel were advised that in 2013 the Internal Oversight Office of WMO Secretariat carried out one of its regular audits on the WMO Fellowship Programme. The findings from this audit have not yet been reviewed by the Audit Committee and thus the report was not provided to the Panel. The Panel were advised that the audit found no major problems with the Fellowship Programme with action already underway to address the minor findings raised in the recommendations.

### Engaging Present And Former Fellows

The Panel noted that over time the strongest advocates for the WMO Fellowship programme are the fellows themselves. The Panel was informed that to capture the potential of this advocacy group the WMO fellowship Division has created a framework that can act as an alumni group for former fellows and an information sharing mechanism for existing fellows. The WMO Fellows in Touch (WMO FIT) initiative is designed to accomplish this objective. Within the framework of WMO FIT are platforms for current and past fellows to share their professional profiles with other colleagues through Facebook, LinkedIn, WMO MOODLE and Twitter.

The Panel acknowledged that the WMO FIT would enable fellows to: i) share their experience during and after training, ii) keep in touch with or to meet online other WMO fellows around the world, iii) keep informed about meteorology, hydrology and multilateral environment and socio-economic development issues, iv) foster cooperation through exchange on professional challenges, v) enhance their opportunities, and vi) provide

platforms for exchange on social and cultural issues.

The Panel supported former fellows being encouraged to get involved in international scientific and technical activities, as a way of making them more active and less insular, and therefore more useful to their home countries and the international community at large.

#### Improving The WMO Fellowship Programme

The Panel supported the initiatives being taken by the ETR Office to enhance the delivery of WMO fellowships:

- Further develop and consolidate cooperation with partners, especially with the aim of rendering more support to least developed and developing countries;
- Further develop and implement group training/fellowships activities to enhance expertise in WMO High Priority areas;
- Investigate options for targeting short-term fellowships in on-the-job training to selected NMHS experts for cost-effective and sustainable development of capacity at national level;
- Further streamline the fellowship process to ensure efficiency and transparency in the management of the programme, and conformity with the WMO strategies for Service Delivery and Capacity Development;
- Engage current and former fellows to develop a network among meteorological professionals that improves the visibility of the WMO fellowship programme, helps them keep abreast of international issues of relevance to their duties, and could lead to longer-term support for the programme.

#### **4.2 Review of RTCs during 2012 and 2013**

The Panel noted that the 2008–2015 schedule of RTC assessments (updated in 2012) continued with Italy and Israel being assessed during 2013 ([Annex VIII](#)). Planned assessments for Niger and Algeria were postponed due to security issues noted by UN and the host countries of the planned assessors. Assessments for Venezuela, Nigeria, and Brazil were also postponed due to scheduling difficulties. The Panel recalled that Dr Moura, PR of Brasil, advised EC-65 that he was working with a number of universities in Brazil to create a virtual RTC that would replace Belem, which was considered inactive. The “*Guidelines for the Recognition or Reconfirmation of WMO Regional Training Centres (RTCs)*” (from the 24<sup>th</sup> session of the Panel in 2010) was used in the assessments to encourage harmonization and standardization in the review and reporting.

The Panel noted with concern that the Florence component of the RTC in Italy (IBIMET) has had little contact with the WMO ETR Office since the early 2000s. However, the Panel was informed that it has continued offering training to African students in the past two years through bilateral and other aid projects. The Panel noted that IBIMET showed potential to expand its role as an RTC and has already proposed courses for 2014 that include cost sharing. The Panel was advised of the support for IBIMET to retain its RTC status from the review team, the Italian National Research Council (IBIMET’s parent organization), the PR of Italy, RA VI session and the president of the Commission for Agricultural Meteorology. Whilst recognizing the strength of support for IBIMET to retain its RTC status, the Panel also noted the long period in which there had been no interaction with the WMO education and training community, the recommendations of the Panel and decision of EC in previous reconfirmations, and the value of the RTC brand name. Following a lengthy debate the Panel recommended that EC delay reconfirmation of IBIMET as an RTC until EC-68; meanwhile IBIMET’s progress in contributing to the WMO ETRP should be encouraged and monitored.

The Panel noted that the RTC Israel continues to offer support to students from multiple regions. The RTC possess unique strengths in the areas of Agrometeorology and Climate Change response, and it is encouraged to expand their course offerings. The Panel recommended that EC reconfirm the RTC at Bet-Dagan.

Schedule for the Second Cycle of Assessments of RTCs (2008 – 2014)

The Panel updated the RTC review schedule for 2014 and 2015 to enable it to complete the second cycle of RTC assessments by the end of 2015. The completion of the reviews will require the RTCs to submit Self-Assessments in a timely manner. No decision was made regarding a review of the RTC in Iraq in light of the security situation. [Annex XIII](#) shows the full history for this round of assessments

Year	RTC Host	Dates	Convenor
2014	Niger	Possibly September	Didier Reboux
	Algeria	TBD	Kent Johnson or Didier Reboux
	Venezuela	TBD	Vilma Castro
2015	Nigeria		Winifred Jordan
	Angola		ETR Office to seek Portuguese speaking expert
	Iran, Islamic Rep. of		Biswajit MUKHOPADHYAY
2015	Iraq		

**Table 4.1.1. Proposed convenors of the RTC reviews (TBD – to be determined)**

Review of requests for establishment of New WMO- RTCs

The Panel recalled that EC-64 had asked the regional associations to delay nomination of new RTC candidates until after Congress in 2015 to allow the recommendations from the review of the future roles and operations of RTCs to be considered by EC-66 and if necessary Cg-17. In light of this request, the Panel noted that no formal nominations have been made for the establishment of new WMO-RTCs. However, the ETR Office is aware of strong interest from Korea and Fiji for the creation of new RTCs in their countries. Similarly India and China are considering proposing additional institutes in their countries for consideration as RTC components covering hydrology. [Annex XIV](#) lists the status of RTCs

In addition to the host country introduction of their facilities and capabilities Dr J C Nam, Director of the KMA Research Centre on Jeju Island, provided a detailed overview of the education and training capability of KMA and its international training activities. The Panel took particular note of the work that KMA is doing to take its university accredited BIP-M course online in English. Dr Nam noted that at its last session RA II had noted and supported KMA's intention to become an RTC. Dr Nam further advised the Panel that KMA hoped that Congress would approve the recommendations from the review of the future roles and operations of RTCs so that KMA could pursue its interest to become an RTC at Cg-17 or the EC immediately following Congress. The Chair reiterated his earlier thanks to KMA for the significant support that KMA is providing to all WMO Members through its education and training activities.

Summary of RTC Activities for 2012 and 2013

The Panel discussed the activity reports from the RTCs for the 2012 and 2013 periods – see [Annex IX](#). Whilst the number of foreign students reported to be undertaking RTC courses appears to have doubled between 2010/2011 and 2012/2013, the Panel noted that some of the increase was due to institutions that did not report in 2010/2011, some from new RTCs, and some from increased offerings of online training. Nevertheless, the Panel recognized that there had been a significant improvement but it was still not sufficient to meet the anticipated demand discussed earlier in the session.

Regarding the annual reports, the Panel requested the ETR Office to review the annual report templates to separate out course lengths, duration, delivery method and levels to provide the Panel with a better overview of the activities and capabilities of the RTC network. The Panel noted the growing number of online courses that were being offered by the RTCs, particularly within Africa. Just under 10% of the reported 2012–2013 international training figures came from online activities.

#### Issues for the Future

Whilst recognizing with satisfaction the increased offerings by RTCs via face-to-face and distance methods, the Panel noted that the development of competency standards by the Technical Commissions has not yet been widely recognized by the RTCs in the planning, promotion, delivering and assessment of their courses. For courses related to aeronautical meteorological forecasting in particular, the Panel emphasized the importance for the course providers relating the goals and objectives of the course to the underlying knowledge, skills and behaviours of the various competency standards. The Panel noted that from a compliance perspective, Members will benefit more from courses that include assessment and documentation of the learning against the underlying knowledge, skills and behaviours of the competency standards. The Panel requested the ETR Office to continue to inform the RTCs of the need to document whether their meteorology courses address all of the learning outcomes identified in WMO-No. 1083 at the required level and whether they include this documentation in their course statements or certificates.

### **4.3 Report on Future Roles and Operations of RTCs**

The Panel recalled that at its meeting in Pune in 2012 a decision was taken to establish a Task Team to review the future roles and operations of WMO Regional Training Centres (RTCs). The Panel recommended the review because the action plan identified by the EC Panel in 2000 and subsequently approved by Executive Council in 2002 had not resolved a number of underlying and new issues such as:

- Dealing with dormant or unresponsive RTCs;
- Meeting the growing demand for education and training;
- Increasing use and availability of distance and online learning resources;
- Accessing funding to support to an increasing number of RTCs;
- Implementing QMF-based accreditation framework considerations;
- Enhancing engagement with the Members, regional associations and technical commissions.

The Panel Chair noted that the composition of the Task Team had changed with time and that the work reported upon during the session had occurred under the guidance of Dr Robert Riddaway since late 2013. The Panel Chair thanked Dr Riddaway and the Task Team for their commitment, work and comprehensive report (see [Annex X](#)).

Following lengthy and detailed discussions around the strengths/opportunities and weaknesses/threats of the options considered by the Task Team, the Panel focused on two key aspects:

- To what extent each option enhances the effectiveness of the RTCs in contributing to the delivery of the ETR Programme?
- To what extent each option enhances the contribution that the RTCs can make to helping satisfy the increased demand for education and training?

The Panel accepted the Task Team's major recommendations to:

- Keep the existing network of RTCs but take further action to enhance their effectiveness, including changing the criteria and assessment regime for the



- designation and reconfirmation of RTCs so that there is greater emphasis on the need to identify and meet regional training requirements now and in the future;
- Establish a feasibility study of the WMO Global Campus concept to be run within the ETR Office under the auspices of the EC Panel. The WMO Global Campus is envisaged as a global network of national and regional education and training organizations (including RTCs) working together to advance meteorological, hydrological and climate services amongst WMO Members.

The first option was seen to address improving the effectiveness of the RTCs whilst the second one was more forward looking and would build on and complement the first option.

#### Enhancing the effectiveness of the current RTC network

The Panel noted the set of actions recommended by the Task Team to enhance the effectiveness of the current RTC network. The Panel recognized, however, that just specifying actions is not sufficient – there will need to be an action plan with clearly defined responsibilities and outcomes, with one person or body having overall responsibility for the implementation and monitoring of the action plan. The following are the recommended actions agreed by the Panel.

##### *Review process*

- Retain the eight-year review process but introduce more flexibility in the way the review process is carried out. For example, for a very active RTC a decision could be made (based on its self-assessment, input from the Regional Association and other indicators of performance and quality) to have a review which involves a visit to the RTC by a member of the ETR Office under the guidance of a member of the EC Panel; this could be complemented by use of web-based discussions with staff or students if required (supporting action: review the self-assessment tool).
- Require Regional Associations and/or subregional bodies to provide input into the RTC reviews about the extent to which RTCs have contributed to meeting the regional training needs that have been specified.

##### *Monitoring and reporting*

- Require Regional Associations to review activities of all RTCs over the last four years and tentative plans and aspirations for the next four years at the four-yearly meetings of the Regional Associations.
- Require RTCs to provide annual reports that go to ETR and the Regional Associations detailing activities over last 12 months and plans for next 12 months with longer outlooks where possible (supporting action: provide more structure to the existing questionnaire).

##### *Responsibilities and requirements*

- Define the responsibilities of Regional Associations, Permanent Representatives of host countries and RTC Directors with regard to the RTCs.
- Update the requirements to be designated as an RTC so that there is more emphasis on meeting regional training needs, supporting international/regional students, carrying out vocational training activities in conformance with relevant parts of ISO 29990:2010 (Learning services for non-formal education and training – Basic requirements for service providers), and recognizing that delivering/developing e-learning, running off-site activities and providing advice/support are legitimate and expected activities for an RTC.
- Require Regional Associations to make an initial assessment of whether an institution satisfies the requirements to be designated as an RTC and has the capacity to contribute towards meeting regional training needs before making a recommendation to the WMO Executive Council that the institution be recognized as a new RTC.

##### *Resourcing*

- Seek additional resources (e.g. funding/infrastructure and access to experts) to support the development and delivery of education and training, particularly e-learning and online resources.
- Encourage Regional Associations to play a greater role in financing RTC activities.

#### *Documentation*

- Prepare a RTC Handbook (with links to websites for additional information) which will include the criteria and responsibilities along with information/advice concerning sharing, cooperation, partnerships, needs assessment, creating consortia, accreditation, external funding, revenue generation and marketing/branding.

The Panel agreed draft roles and responsibilities for the partners in RTCs and recommended updating the EC Criteria for Recognition and Reconfirmation of RTCs and prepared resolutions for EC along these lines (see [Annex XI](#)).

#### **4.4 WMO Global Campus**

The Panel recalled that the Global Campus concept was raised at SYMET-XII in September 2013 and further elaborated via the Symposium forums. At the Symposium there was considerable interest in the concept but also concern about governance, financing, inclusiveness and quality assurance of educational and training services. However, the Panel recognized that the foundation elements of the proposal (e.g. promotion of collaboration, sharing of resources, and better access to information and resources) are consistent with the actions recommended to enhance the effectiveness of the current RTC network. The Panel was informed that the UK was seconding an expert (Ms Aileen Semple) to the WMO ETR Office who could work on how to take the WMO Global Campus concept forward.

The Panel discussed and agreed with the Task Team recommendation that a feasibility study of the Global Campus be run from within the ETR Office under the auspices of the EC Panel with an advisory committee on how to stimulate and test the idea of a WMO Global Campus. The advisory committee should involve potential users and contributors (including representation from Directors of existing RTCs). Following extensive discussions the Panel identified that through implementation of the WMO Global Campus Members would benefit from:

- Access to new resources;
- New education and training partners;
- New approaches to development and delivery;
- Access to a broader community of providers and users;
- Enhanced collaboration between RTCs and between RTCs and other education and training institutions;
- Increased access to expertise and material by the RTCs;
- Shared development of new materials and updates to existing resources.

The Panel proposed that the outcome of initial feasibility study be provided to Congress in May 2015 (Cg-17). The Panel recommended that Congress should be provided with a report on the feasibility, desirability and suggested roadmap of implementing the Global Campus. The initial feasibility study should (a) elaborate on the vision and how the Members would benefit from the Global Campus, (b) provide further details on areas such as governance, quality assurance mechanisms and resources required for successful implementation and ongoing sustainability, and (c) prepare a roadmap for the next stage in the development of the WMO Global Campus concept. The feasibility study ([Annex XVI](#)) might include all or some of the following.

- Building clarity of the concept of the Global Campus and the potential benefits amongst WMO Members.
- Investigating options to develop a trial Global Campus registry of resources and activities, exploiting where possible an existing registry, and exploring how the Global Campus could utilize the capabilities of WIS.

- Establishing basic criteria for partners and providers to list resources and activities on the registry and developing ways to actively solicit and encourage organizations to offer their resources to WMO Members.
- Testing new arrangements/processes that have the potential to provide more resources in multiple languages at modest cost.
- Investigating ways to assure the quality of resources and activities available via the Global Campus.
- Examining issues surrounding the acceptance of courses and credits from a dispersed set of providers by surveying representative users.
- Engaging with at least one new global partner as a way of increasing the capacity for WMO education and training activities.
- Seeking new resources for supporting education and training, especially in climate services and hydrology, that can be made available to WMO Members.
- Examining and testing ideas for providing training and support to RTCs so that they could (a) make an increasing contribution to providing resources, particularly for e-learning, to the Global Campus and (b) benefit from the resources available via the Global Campus.
- Identifying and recognizing potential constraints/challenges in the implementation of the Global Campus and, where possible, propose ways of overcoming them.
- Identifying the human and financial resources required, along with possible resourcing arrangements, for implementation of the Global Campus in terms of both initiation and maintenance.

#### **4.5 Report of the Co-Chairs of the Working Group on Distance and Online Learning**

The Panel received a report from the Co-Chairs of the Working Group on Distance and Online Learning. The Panel recalled the Terms of Reference for the Working Group:

- (i) Encourage and stimulate the development and use of distance and online learning through partnerships and collaborations; accomplished through broad distance learning programs and specific activities conducted by RTCs;
- (ii) Provide leadership through the organization of online training in a key priority area;
- (iii) Look for opportunities to acquire training resources from accredited institutions.

The two co-chairs, Dr Vilma Castro and Dr Tim Spangler, contacted several universities around the world encouraging them to offer courses that would satisfy the full BIP-M online with little success. However, Dr Spangler was able to support the refresher courses for Aeronautical Forecasters at CIMH (AERO-CPD) with help from COMET as an online vocational course. Dr Castro adapted the CIMH AERO-CPD course for Spanish speakers and offered it through the University of Costa Rica Outreach Program.

The English version of the CIMH course has now been offered three times, with 16 forecasters presently enrolled, and 17 out of 24 previous participants having endorsing it. The Spanish version courses were advertised through several web pages, and to the meeting of Ibero-American Directors in Brazil in 2013. There have been requests for the courses from individuals from different countries and from institutions in El Salvador (in 2012 and 2013), Ecuador and Colombia (in 2013). Funds are available for these institutions but their administrative procedures meant that the funds could not be paid. Some individuals wanted to take the courses using personal funds, but numbers were too low to open a course. While numbers were high in the case of Mexico, the expectation of possible training fellowships by AEMET set individual initiatives on hold.

The Panel noted that the Costa Rica's experience could indicate that when institutions have to pay for training, particularly in another country, the administrative procedures can be difficult to overcome. The Panel recognized that the development and delivery of all training needs to be funded and so someone needs to pay for the staff time and resources. However, if RTCs and other institutions could access project funds to provide the training it would remove a major administrative hurdle of collecting funds from the training participants or their organizations.

Given the proposal for the Global Campus, the Panel decided to incorporate the work of the Task Team within the wider Global Campus concept. The Chair thanked the two co-chairs of the Working Group for their contributions over the last five years.

#### **4.6 Training Needs**

The Panel discussed at length a paper prepared by the ETR Office looking at the staffing profiles and capabilities of Members. The paper drew on data from a range of sources in the Secretariat such as "Pub 5" regarding official languages, the WMO assessed contribution rates for Members, returns from surveys from the Strategic Planning Office, Regional Offices, usage information from COMET, and particularly an informal survey to Members regarding their NMHSs staffing profiles and capabilities.

The overall aim of the paper was to provide some guidance for the Panel on how many people in what countries would need education and training over the next six years; in particular what sort of numbers and areas would Members not be able to address on a national basis. The Panel noted that caution was required in using the data from the ETR survey as the returned data would sometimes represent the country and in other cases it only represented the institution of the person who returned the data. The most extreme case was China where the returned data only represented CMA, so it did not include the hydrology service which has of the order of 48,000 staff. From the reported figures, just under 25% of the global workforce is involved in the provision of weather services and this is the category with the largest workforce in the ETR survey. The second largest workforce by category is shared between "Administration and Management" and Observations at around 20% of the reported workforce each. Provision of climate services involves around 3% of the total workforce.

The Panel noted the potential for this sort of information as part of the medium- to longer-term planning for demand on the ETRP and requested that the ETR Office continue with the data collection and analysis. The Panel also suggested that the EC Working Group on Strategic and Operational Planning be made aware of the data and analysis for consideration in their work. To test the usefulness of the approach, the Panel assumed an annual turnover of staff of 5%. So using just the advised total staff this suggests that globally around 7,500 new staff across all categories are inducted into NMHSs annually. As around 25% of the global NMHS workforce is in weather services then just under 2,000 of these new staff are in weather services. Breaking this down based on the preliminary analysis of which Members have national training facilities suggests that of the order of 200 new staff per year have to be inducted into the weather services of NMHSs that do not have national training facilities. As the WMO Fellowship Programme can only assist around 50 new fellows per year, this indicates an unmet demand of three times our current capability. The Panel noted the many uncertainties and assumptions needed to derive this estimate, but as an initial planning tool it provided one estimate of future demand.

#### **4.7 Update on Competency activities**

The Panel noted with pleasure that the competency standards for education and training providers would be added to the WMO Technical Regulations in the next update. This followed consultation with the Members following EC-65.

The Panel reviewed the development of competency standards in the various WMO Technical Commissions as summarized in Table 1. The Panel welcomed the progress being made in the key areas, particularly the public weather service (general) forecasting area and JCOMM and CCI. The Panel recognized that the general forecaster competency standards are very important as they are the link between the qualifications as described within the BIP-M and the specialist competency standards in areas such as Aeronautical Meteorology and Marine Meteorology.

The Panel anticipated that all of these competency frameworks would be contained within the WMO Technical Regulations as Recommended Practices (with the exception of the Aeronautical Meteorological Personnel Competence Standards which are mandatory).

The Panel was informed that to date there has been excellent cooperation and coordination between the various Technical Departments within the WMO Secretariat and the ETR Office in the development of the competency standards.

Commission	Status
Commission for Basic Systems	<p>CBS-OPAG-PWS have drafted competency standards covering core job-tasks around:</p> <ul style="list-style-type: none"> <li>• Disaster Prevention and Mitigation Weather Advisor</li> <li>• Improvement, innovation and delivery of Meteorological and Hydrological Service and Products</li> <li>• Weather Broadcasters and Communicators</li> <li>• Public Weather Service advisors</li> <li>• Public Weather Service Forecasters</li> </ul> <p>The draft standards have been circulated for comment within the ETR community as well as the wider WMO community. CBS-Ext will consider these in September 2014.</p> <p>The CBS teams developing WIS have also created a draft set of competency standards for personnel involved with WIS. In addition to developing top and second level competency statements they have extended it to include a learning guide for personnel.</p> <p>Within the Tropical Cyclone Programme competency standards for personnel involved in hurricane / tropical cyclone / typhoon services are under development. This is being done on a sub-region by sub-regional basis but in most cases they are starting from the example of the Tropical Cyclone Forecaster competency standard framework from the Australian Bureau of Meteorology.</p>
Commission for Instruments and Methods of Observation	Included in the CIMO work plan, little progress due to resource constraints.
Commission for Hydrology	CHy have created a joint task team with UNESCO - IHP to review the definitions, qualifications and competency standards for personnel in operational hydrology.
Commission for Atmospheric Sciences	Processes and procedures in areas such as GAW well described but not in competency standard framework.
Commission for Aeronautical Meteorology	Competency standards in force.
Commission for Agricultural Meteorology	CAGM is expecting to work on this in the next intersessional period and will also update and revise WMO 258 4 <sup>th</sup> Ed Supplement 2 to learning outcomes at the

	same time.
Commission for Climatology	Draft Competency standards developed. Comments and feedback are being sought before the Commission session in mid 2014.
Joint WMO-IOC Commission for Oceanography and Marine Meteorology	Draft Competency standards developed. Comments and feedback being sought before being considered by the JCOMM Management Group in October 2014.
EC Panel of Experts on Education and Training	Competency standards for Education and Training providers developed and approved for inclusion in the WMO Technical Regulations.

The Panel noted that the development of competency standards for key job-tasks within meteorology, hydrology and climatology is progressing well. The key lessons learnt to date are:

- Describe them as competency standards for “personnel involved in the provision of -----” rather than, for example “aeronautical meteorological forecaster competency standards.” The latter approach can lead to the impression that all personnel involved in a particular service are required to demonstrate all of the competencies, rather than just those that are relevant to the tasks they undertake.
- Clarify and standardise on terminology: competence vs. competency. Use of “competency” is recommended to denote the descriptions of job tasks, while “competence” is the demonstrable state of being competent at some level. However in English the two terms are often used interchangeably.
- Avoid including core or general capabilities such as teamwork, decision-making and organization with the technical competency frameworks to describe the tasks of specific job functions.
- Preface the competency framework with a list of the associated conditions that would mediate which performance components (or criteria) and knowledge requirements are appropriate for a given NMHS.
- Have the training institutes, particularly the RTCs, document and describe which elements of the various competency standards a particular course addresses and whether there is any assessment involved in the course that can be used as part of the documentation for the NMHS that the person has the required knowledge, skills and behaviours.
- Encourage the development and extension of the learning guides created by the WIS team to assist the training institutions in developing the appropriate courses and supporting resources.
- Assist Members and training institutes in methods of assessing and documenting competencies, particularly building upon the experience from CAeM with the competency standards for aeronautical meteorological personnel.

Whilst there is a publication (WMO No. 1083, Manual on the Implementation of Education and Training Standards in Meteorology and Hydrology, Volume I) supporting the regulatory material contained in the qualifications chapter 4 of WMO-No. 49 Vol 1, the competency material contained in Chapter 5 of WMO-No. 49 Vol 1 does not have such a supporting publication. The Panel decided to develop a publication (a new WMO Guide) on competency standards that would support the material that will be included in Chapter 5 of WMO-No. 49 in the future. The first section(s) should address the rationale and general descriptions of competency standards with specific chapters (written and updated by each of the Technical Commissions/Departments) addressing their specialist areas. The ETRP would

need to fund the development, updating and translation of the general material on competency standards plus the chapter on competency standards for training providers whilst the other programmes would have to be responsible for their sections. The ETRP would be responsible for reminding the other programmes of the need to update the material.

#### **4.8 Follow up on Introduction to BIP-M**

The Panel noted that the ETR Office has not formally requested information from WMO Members or RTCs regarding how many of the training institutes have reviewed their programmes against the new BIP-M and how many are compliant based upon their self or other assessment. Noting the discussion earlier in the session on KPIs, this data would be available for the Panel session in 2018.

The Panel was informed that many of the NMHS training institutes in developed countries, particularly those where the NMHS is the meteorological service provider, have reviewed and adapted their programmes to be compliant with the new BIP-M as detailed in WMO-No. 1083 “Manual on the Implementation of Education and Training Standards in Meteorology and Hydrology - Vol 1 Meteorology”.

The Panel was advised that the status for developing and least developed countries is less well known and the ETR Office anticipate that many of the training institutions will not have updated their programmes. In some cases the Panel considered that the institutes may not even be aware of the changes or need to update, despite the communication provided from the Secretary-General and the ETR Office. There is evidence that a number of universities have also used WMO-No 1083 to review their programmes.

The Panel noted and agreed that Supplement 1 to WMO-No. 258 will be declared obsolete at the Commission for Aeronautical Meteorology in July 2014. CAgM is keeping Supplement 2 alive until a replacement document is published in the next intersessional period.

#### **Impact on Aeronautical Meteorological Service Providers**

The Panel noted that by 1 December 2016 all meteorological service providers to international air navigation will need to be able to demonstrate that their Aeronautical Meteorological Forecasters will not only be competent but will also be qualified. As aeronautical meteorological services operate under a Quality Management Framework this means that the meteorological service providers must have documentation stating that their staff are qualified. The Panel was advised that the ETR Office continues to be very active in reminding training institutes, particularly RTCs, that Members will come to them to request this documentation.

The Panel noted that the ETR Office survey on staffing needs and profiles of NMHSs addressed the total number of Aeronautical Meteorological Forecasters. The Panel recalled that there was a follow-up question seeking information about the expected number of forecasters who would not meet the 1 December 2016 requirements. The Panel noted that the total number of Aeronautical Meteorological Forecasters from this survey was 5,758 with only 338 anticipated to not meet the 1 December 2016 requirements.

The Panel noted that whilst this number is quite small in terms of the overall total further investigation indicated that on this data at least 23 Members would have more than 30% of their staff unqualified on 1 December 2016. Noting further that many of the countries that have not provided data are typically those countries where the NMHS finds it difficult to attract and retain qualified staff, the Panel suggested that a significant number of Members may be in breach of the qualification requirements on 1 December 2016. The Panel was advised that this information would be drawn to EC-66’s attention through the Aviation Meteorology paper.

## Status of action for hydrology

The Panel was advised that the Commission for Hydrology has been following the review and update of the Basic Instruction Packages for Meteorologists and Meteorological Technicians and the definitions of Meteorologists and Meteorological Technicians. The Panel noted that the Commission has set up a joint Task Team with UNESCO-IHP to “develop a definition for Hydrologists and Hydrological Technicians and their Basic Instructional Packages (at a reasonable level of detail); and develop competency standards for a few core job tasks in critical areas”. A first meeting of the joint Task Team is expected to be held later in 2014. The Panel welcomed this development and asked to be kept informed of progress.

### 4.9 Regional Reports

The Panel members responsible for liaising with RA IV and V regional associations provided brief reports from the two regions regarding the expressed education and training needs. The members noted the difficulty in obtaining information and feedback from the regions. The limited feedback available was consistent with the challenges and opportunities discussed under Agenda Item 2.

## 5 *ETRP TRAINING ACTIVITIES*

### 5.1 Draft 2016 – 2019 Expected Results, Programmes and activities

The Panel were advised that for the 2016–2019 financial period, consideration is being given to providing information including attribution to programmes. Thus an activity will be labelled with Expected Result (ER), Programme and implementing department. Additionally, to reduce the number of internal transfers, consideration is being given to allocating training funds previously handled by the ETR Office directly to the offices that will implement them. As these funds typically amount to around 25% of the non-post ETR Office budget, depending upon exactly how the breakdown of funds are reported in the draft budget, it could look like the ETR budget has been reduced when this is not the case. Similarly if the budget is described in terms of WMO Programmes, depending upon the amount of training funded by the other programmes during this financial period, the ETRP budget could appear substantially larger than the ETR Office budget.

From a practical perspective it is expected that the direct funds available for ETRP activities for the next financial period should be similar if not a little more than the current period. The final amounts will be dependant upon which of the budget scenarios EC and finally Congress decide to adopt.

### 5.2 Draft 2016 – 2019 Strategic Priorities

The Panel recalled that the EC Working Group on Strategic and Operating Plan (WG-SOP) has recommended the following as the WMO Priorities for 2016 to 2019:

**Disaster Risk Reduction (DRR)** – emphasis is on aligning WMO’s contribution to the new international DRR framework, further developing multi-hazard early warning systems, strengthening partnerships between NMHSs and Civil Emergency Authorities, transitioning the Severe Weather Demonstration Projects into real-time operational entities, and supporting Members goals to improve their nation’s resilience to weather, water and climate extremes, with the latter being a key element of GFCS.

**Service Delivery** – there are three elements under this priority: a focus on effective, timely, efficient and impact-oriented services to the public; positioning Members to influence and optimize benefits from the proposed changes in the new international civil aviation regime and support the development of marine services in polar and coastal regions. Measures of socio-economic benefits are an important element of service delivery.



**Global Framework for Climate Services (GFCS)** – to exercise WMO's leadership role in developing essential climate services to support decision-making that reduces the impacts of climate-related disasters, improves food security and health outcomes, and enhances water resource management by contributing to the 6- and 10-year milestones outlined in the Implementation Plan.

**Scientific research** – emphasis is on bringing research into operations particularly in the areas of: high impact weather, sub-seasonal to seasonal predictions, polar weather prediction, and advancing forecast and warning services in megacities. In support of climate change and services objectives, there will be emphasis on a new greenhouse gas monitoring system and improving climate projections.

**WMO Integrated Observing System (WIGOS)** – to reach full implementation of the WIGOS Plan for robust, standardized, accurate and quality assured observations of the Earth System to meet the needs of WMO Members coupled with the operational WMO Information System (WIS). Data management networks and systems are equally important.

**Capacity development** – to advance the WMO Capacity Development Strategy targeted on the priorities above (particularly in developing, least developed countries and SIDS), to address deficiencies (e.g. infrastructure and human resources), and to enhance the capability of the NMHSs to fulfil their mandates. Capacity building underpins everything WMO does with the aim of filling gaps particularly in human resource and succession development.

The activities proposed in the Secretary-General's budget to support the high priority areas are:

#### **Disaster Risk Reduction (DRR)**

- Financial support for SWFDP and GDPFS (NWP) workshops on alternate years.
- Financial support for tropical cyclone and hurricane workshops annual.
- Financial support, through VCP-F, to enable participants from LDCs, SIDS and developing countries to attend workshops provided by WMO Members through the RTC network.
- Annual financial support to the CHy Education and Training Strategy activities related to flood forecasting and mitigation.
- Liaison and coordination with RTCs and the DRR programme to create new education and training opportunities in multi-hazard early warning systems and coordination with Civil Emergency Authorities.

#### **Service Delivery**

- Financial support for annual PWS workshops.
- Financial support for Marine Forecasting workshops (biannual).
- Financial support for Aeronautical meteorology workshops (biannual).
- Financial support, through VCP-F, to enable participants from LDCs, SIDS and developing countries to attend workshops provided by WMO Members through the RTC network.
- Support to CBS expert teams in the development of competencies and competency assessment.

#### **Global Framework for Climate Services (GFCS)**

- Financial support for Climate monitoring and watch system workshops (biannual).
- Annual financial support to the CHy Education and Training Strategy activities related to water resource management.
- Annual financial support for roving seminars on weather, climate and farmers.
- Biannual financial support for training course on Agrometeorology.
- Biannual financial support for training course on climate forecasting and verification.

- Biannual financial support for training course on producing and using climate service products.
- Financial support, through VCP-F, to enable participants from LDCs, SIDS and developing countries to attend workshops provided by WMO Members through the RTC network.
- Support to CCI and CHy expert teams in the development of competencies and competency assessment.

#### **Scientific research**

- Financial support for WMO fellows undertaking PhD studies (in combination with The World Academy of Sciences).
- Cooperation with leading institutes to place NMHS personnel for short term fellowships looking at issues related to DRR and GFCS.
- Financial support, through VCP-F, to enable participants from LDCs, SIDS and developing countries to attend WWRP/WRCP workshops and events such as conferences aimed at early career scientists.

#### **WMO Integrated Observing System (WIGOS)**

- Biannual financial support for oceanographic observations and network workshops.
- Biannual financial support from regular budget for instrument workshops.
- Financial support, through Trust Funds, to enable participants from LDCs, SIDS and developing countries to attend instrument maintenance and calibration workshops provided by WMO Members through the RTC/RIC network.
- Financial support, through VCP-F, to enable participants from LDCs, SIDS and developing countries to attend workshops related to WIS, AWS and upper-air networks.
- Annual financial support for GAW measurement and quality assurance workshops.
- Support for activities in the WMO Virtual Laboratory for Satellite Meteorology.

#### **Capacity development**

- Annual financial support for Fellowships.
- Support for RTCs and training institutes from Member countries to develop and sustain education and training programmes.
- Annual financial support for face-to-face and online training activities for trainers.
- Support for EC Panel of Experts on Education and Training.
- Financial support to hold one ETR Symposium.
- Biannual financial support for HRD workshops for NMHS staff.
- Financial support for one coordination meeting of RTC directors.
- Financial support for one curriculum development workshop.
- Financial support for review and assistance to RTCs, development of training publications, promotion of e-learning, provision of training advice and services.

The Panel acknowledged that in essence all of these activities are capacity development activities. The Panel further recognized that these activities are an evolution of those funded over recent financial periods. The Panel welcomed advice that in cooperation with the Resource Mobilisation and Development Partnership Office, the ETR Office will continue to seek additional funds from extra-budgetary resources. The Panel noted that due to the existing staffing and workload in the ETR Office, new partners and methods of providing the education and training are also required with any additional funds.

The Panel suggested that the ETR Office's recent experience in partnering with the WMO OBS department and the RTC/RIC in Kenya to provide a four week training course on instrument maintenance and calibration using Trust Funds suggests that it may be possible to look at different options for delivering education and training from Regular Funds and Trust Funds. At the present time the majority of the workshops funded under the WMO Regular budget are developed and organized by WMO Secretariat staff.

The Panel stated that the key to Members experiencing enhanced support to help address their education and training needs is not just increased funds, but increased coordination and cooperation at all levels within WMO.

### **5.3 Joint sessions with the Informal Planning Meeting**

The Panel welcomed the initiative of holding the Informal Planning Meeting (IPM) of the WMO Voluntary Contribution Programme members coincidentally with the Panel to allow some joint sessions. Furthermore, focusing one of the joint sessions around the activities of potential WMO partners such as regional development banks, regional centres and national agencies, and a second session around the potential for collaboration between the WMO ETR community and the traditional NMHS development partners was very useful as it gave the opportunity for the Panel to interact with groups it would not normally contact. The IPM were able to provide the Panel with some feedback on the WMO Global Campus and enhancement of RTCs whilst the IPM were interested in the results of the workforce profiles and capability study. The Chair challenged the two groups to use the coming months to explore options for enhancing the cooperation between them, particularly around activities such as the WMO Global Campus and the enhancement of RTCs. The Chair encouraged the IPM members to consider liaising with the ETR Office in terms of education and training requirements related to international projects they are proposing or implementing.

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

The Panel noted that earlier agenda items had assisted in identifying the major gaps between current plans and anticipated member requirements. The proposals to improve the effectiveness of the RTC network and introduce the WMO Global Campus should help reduce the anticipated gaps but will require further investment of resources from Members and outside partners to be effective. The Panel encouraged the ETR Office to continue with collecting data on Member staffing numbers and profiles and their education and training capabilities. This information was a very necessary for monitoring and planning.

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

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

The Panel welcomed the appointments of Dr Patrick Parrish and Ms FAN Hong to the ETR Office over the intersessional period. The two officers were well known in the ETR community and the Panel anticipated that their knowledge, skills and insights would enable the ETR Office to even more effectively support Members and help deliver the ETRP. The Panel appreciated the increased use of email groups such as ETR Focal Points and RTC focal points to keep the ETR community advised of courses, opportunities and information that could assist the Members in their education and training activities. The Panel congratulated the ETR Office on the quality and quantity of the activities carried out over the last two years and looked forward to being briefed on the outcomes of the first online train-the-trainer seminar that commenced just before the session

### **ANY OTHER BUSINESS**

Nil

### **NEXT MEETING**

The Panel agreed that its next session should take place in the first quarter of 2016. Noting that a Panel session had not been held in Africa for some time, the Panel

encouraged the ETR Office to investigate options for holding the next session at one of the African RTCs, taking into account cost effectiveness and security concerns.

## ***APPROVAL OF THE DRAFT REPORT***

The Panel reviewed and approved the recommendations coming from the session for EC-66. The Chair requested that the Secretariat prepare the draft report of the session for his review and then circulate it for approval by the Panel. Action items from this session are listed in [Annex XV](#).

## ***CLOSURE OF THE SESSION***

The Chair of the session expressed his satisfaction with respect to the constructive spirit in which the Panel worked throughout the week and the quantity and quality of the recommendations from the session for the ETRP and Members in general.

The Chair commented on the positive aspects of holding the session in Korea and the opportunity to experience first hand the facilities KMA are proposing for an RTC and to have discussions on their international training programme. In closing he once again thanked the host country and the team at the KMA for their continuous support, hospitality and local arrangements.

The session was closed on 28 March 2014 at 17:35.

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## ***Annex I. A 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 CONGRESS-16 AND EXECUTIVE COUNCIL - 63**
  - 2.1 Major Outcomes From Congress And Executive Council
  
- 3. EXCHANGE OF VIEWS ON THE GOALS AND OBJECTIVES OF THE WMO EDUCATION AND TRAINING PROGRAMME (ETRP) IN THIS FINANCIAL PERIOD**
  
- 4. IDENTIFICATION OF WMO HUMAN RESOURCE DEVELOPMENT REQUIREMENTS**
  - 4.1 The WMO Fellowship Programme
  - 4.2 Review of RTCs during 2012 and 2013
  - 4.3 Report and recommendations from the Task Team on the future roles and operations of RTCs
  - 4.4 WMO Global Campus
  - 4.5 Report of the Co-Chairs of the Working Group on Distance and Online Learning
  - 4.6 Member Training needs
  - 4.7 Update on competency activities
  - 4.8 Followup on the introduction to BIP-M
  - 4.9 Regional reports
  
- 5. PLANNED TRAINING ACTIVITIES AND APPROACHES TO MEET THE DEVELOPMENT REQUIREMENTS**
  - 5.1 Draft 2016 – 2019 Expected Results, Programmes and activities
  - 5.2 Draft 2016 – 2019 Strategic Priorities\
  - 5.3 Joint sessions with the Informal Planning Meeting
  
- 6. IDENTIFICATION OF GAPS BETWEEN DEVELOPMENT REQUIREMENTS AND CURRENT PLANS AND OPTIONS TO REDUCE THE GAPS**
  
- 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**

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### ***Annex III. Terms of Reference for EC Panel of Experts on Education and Training***

#### **DRAFT TERMS OF REFERENCE OF THE EXECUTIVE COUNCIL PANEL OF EXPERTS ON EDUCATION AND TRAINING**

THE EXECUTIVE COUNCIL,

**Noting:**

(1) Paragraph 3.9 (a) WMO No. 1078 Proceedings of the Executive Council (EC-LXIII) – Executive Council Panel of Experts on Education and Training,

(2) Resolution 31 (Cg-XVI) – Education and Training Programme,

Considering that education and training in meteorology, hydrology and related disciplines is a major cross-cutting activity of WMO that has a large impact on enhancing the knowledge and expertise available to National Meteorological and Hydrological Services and improving the quality of products and services delivered to the users, (add climate here)

Further considering that the scope and demand for education and training is expanding with initiatives such as the Global Framework for Climate Services, Disaster Risk Reduction and increasing compliance requirements,

**Decides:** To adopt the terms of reference for the Executive Council Panel of Experts on Education and Training as follows:

- (1) To provide Executive Council with proposals for the future direction and activities of the WMO Education and Training Programme including the development of a strategy towards the introduction of the WMO Global Campus;
- (2) To provide Executive Council with advice on the standards for education and training of personnel of National Meteorological and Hydrological Services;
- (3) To provide Executive Council with advice on actions for monitoring, strengthening and enhancing the existing Regional Training Centre network as well as the designation of suitable training institutions as WMO Regional Training Centres;
- (4) To monitor and review the fellowship programme, providing guidance and advice to Executive Council on actions that could be taken to strengthen the programme and its effectiveness;
- (5) To liaise with the WMO regional associations and technical commissions regarding the planning, delivery and evaluation of education and training activities within their respective areas of responsibility;
- (6) To contribute to the preparation of the WMO Strategic and Operating Plans by providing input, comments and recommendations with regard to the capacity-building parts of the Plans;
- (7) To review the priorities and direction of the education and training activities undertaken by the Secretariat against the Operating plan;



#### Membership:

- (i) The Panel will be chaired either by the President of the Organization or a designated member of Executive Council, if the Chair cannot attend a session of the Panel, she/he will appoint a Panel member to chair the session in her/his absence;
- (ii) In addition to the Chair, the Panel shall consist of a maximum of twelve members, each of whom will sit in a personal capacity;
- (iii) The members shall be appointed by the Executive Council on the basis of their extensive professional expertise in education and training matters. The Executive Council shall ensure that the membership as a whole has a blend of relevant expertise, including knowledge of the operational and strategic direction of the WMO, in particular its Education and Training Programme. The Executive Council shall take into account the need for the Panel to have an appropriate technical, geographical and gender balance in considering the most highly qualified candidates;
- (iv) In addition to acting in a personal capacity Panel members will be expected to act as a liaison between the Panel and a regional association and/or a technical commission to promote cross-cutting coordination;
- (v) Members shall serve for a period of four years and may be re-appointed for one further period of four years. No individual may serve for more than eight years in total;

#### Appointment of Members:

The Panel members shall be appointed by the Executive Council through a transparent process as follows:

- (a) The Secretary-General will write to all Members, with copy to the presidents of regional associations and technical commissions, at least six months prior to Congress advising them of the opportunity to nominate one person with appropriate skills for consideration by EC for the EC Panel of Experts on Education and Training. Nominations endorsed by the PR of the country concerned, or president of the appropriate regional association or technical commission, to reach the Secretary-General no later than 3 months before Congress;
- (b) The Secretariat will review the qualifications, determine whether they meet the minimum requirements needed to serve, and submit a prioritised list of candidates to the Executive Council immediately following Congress;
- (c) The Council will appoint members of the Panel from the list of candidates compiled by the Secretariat. The Council may choose to create a selection committee to review the list prepared by the Secretary-General. The Council will authorize the President to fill any positions that fall vacant during the intersessional period using the list approved by EC;
- (d) In accordance with General Regulation 35 (2012 Edition) the Chair of the Panel can invite experts to assist the Panel in its deliberations.

Administrative matters:

Financial support for participation by Panel members in meetings shall be provided by the Organization in accordance with General Regulation 37 (2012 Edition).

Note: This resolution replaces Resolution 19 (EC-LXII), which is no longer in force.

## **Annex IV. Draft description of the WMO Education and Training Programme**

### **Education and Training Programme (ETRP)**

#### **6.2.0 Overall objective**

**6.2.0.1** The overall objective of ETRP is to assist the National Meteorological and Hydrological Services (NMHS) of Member States develop staff with the competencies (knowledge, skills and behaviors) required to deliver the meteorological, hydrological and related services mandated by their Government and required to meet their international obligations.

#### **6.2.1 Purpose and scope**

**6.2.1.1** To assist Members develop and utilize education and training resources in meteorology and hydrology, and to assist in coordinating the setting of international standards for this education and training.

**6.2.1.2** Assist Members, particularly Least Developed Countries (LDCs) and Small Island Developing States (SIDSs), facing difficulties in providing initial and ongoing meteorological and hydrological education and training of their staff at national level through bi- and multi-lateral activities. The institutions in which the education and training activities are carried out include WMO Regional Training Centres (RTCs), national meteorological training institutions, the training units of Meteorological Services, universities and research centres.

**6.2.1.3** The activities of the ETRP encompass the following broad approaches:

- (a) Develop and review the standards required for education and training of Meteorologists, Meteorological Technicians, Hydrologists or Hydrological Technicians in line with changing international regulations, technical and educational and societal demands;
- (b) Liaise with the WMO Technical Commissions in the development of the competencies (knowledge, skills and behaviors) required for the specialist areas overseen by each of the Commissions;
- (c) Assist NMHSs develop adequately trained staff to provide meteorological, climatological and hydrological related information and services;
- (d) Promote capacity development by assisting NMHSs become self-sufficient in meeting their education and training needs and developing their human resources;
- (e) Promote and strengthen the development and exchange of education and training knowledge, resources and expertise between Members, making particular use of relevant technologies and techniques such as e-learning and further exploring the options for implementing the WMO Global Campus ;
- (f) Promote high-quality continuing education in meteorology, climatology, hydrology and related disciplines to update the knowledge and skill of NMHS staff in line with scientific, technological and educational advances and innovations;
- (g) Assist in the education of the public, governments and other interested parties regarding the societal socio-economic benefits of meteorological, hydrological, oceanographic and related services.

These approaches will ensure that the high priority activities of transport services, WIGOS, GFCS and Disaster Risk Reduction are supported by the development and execution of appropriate training programmes.

## **6.2.2 ETRP Governance**

**6.2.2.1** Oversight for the ETRP is provided by the WMO Executive Council.

## **6.2.3 ETRP structure**

**6.2.3.1** ETRP consists of four interdependent components:

- (a) Human resources development;
- (b) Training activities;
- (c) Education and training fellowships;
- (d) Support to training events under other WMO Programmes.

## **6.2.4 Human resource development**

**6.2.4.1 Purpose and scope:** To provide a framework for assessing the present and future needs of Members for educated and trained personnel. This framework provides an objective basis for planning and setting priorities, as well as assisting and providing advice to Members. The activities under this component will contribute to the implementation of Expected Result 6 through an enhancement of the management capabilities of personnel in Member States, particularly those from NMHSs.

### **6.2.4.2 Long-term objective:**

- (a) Human resource development in NMHSs is supported through a coordinated, priority driven, approach.

## **6.2.5 Training activities**

**6.2.5.1 Purpose and scope:** To contribute to the education and training process with respect to training centres, in particular RTCs, through provision of training materials, instructors and management of training events, and by acting as the interface between Meteorological and Hydrological Services and the international meteorological and hydrological education and training community. The activities under this component will contribute to the implementation of Expected Result 6 by an enhancement of the capabilities of education and training personnel in Member States, particularly those from NMHSs.

### **6.2.5.2 Long-term objectives:**

- (a) More effective use of training materials and technologies, including distance learning techniques is made by Members;
- (b) RTC training activities meet more Member demands;
- (c) More effective, and wider, utilization by user sectors of meteorological and hydrological information and services.

## **6.2.6 Education and training fellowships**

**6.2.6.1 Purpose and scope:** To assist Members educate and train meteorological and hydrological personnel through funding and organization of specially tailored individual and

group study training programmes, including management and familiarization visits/study tours for senior personnel. This component focuses on the provision of long-term and short-term fellowships to NMHS personnel. The activities under this component will contribute to the implementation of Expected Result 6 by an enhancement of the number of qualified personnel in Member States, particularly those from NMHSs. Education and training is mainly provided in subject areas and technologies for which the facilities and teaching expertise are not available at home. Emphasis continues to be placed on using, as a first priority, the training facilities within the regions concerned, in particular those of the RTCs.

**6.2.6.2 Long-term objective:** Human resources in NMHSs are strengthened through the implementation of short- and long-term fellowships.

#### **6.2.7 Support to training events under other WMO Programmes**

**6.2.7.1 Purpose and scope:** To monitor, coordinate and assist the planning of training events implemented by Members or the Secretariat under other WMO Programmes which include specific training responsibilities. The scope of the component therefore extends to collaboration and interaction with the other major Programmes of the Organization. The activities under this component will contribute to the implementation of Expected Results 1 to 6 by an enhancement of the capabilities of personnel in Member States in specialized areas, particularly those from NMHSs.

**6.2.7.2 Long-term objective:** Education and training activities are coordinated across all WMO Programmes.

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## Annex V. Summary of 2012 and 2013 Fellowship activities

Details of fellowship awards for the period 2012 to 2013 are provided below, along with the equivalent for 2010 – 2011 and the longer term total numbers.

Former and awarded fellows commencing study on or after 1 January 2012 but no later than 31 Dec 2013							
	RA I	RA II	RA III	RA IV	RA V	RA VI	
Long-term	52	15	5	11	9	3	95
Short-term	28	3	12	12	3	1	59
Very Short-term	25	1					26
Familiarisation visits of PRs	15	1					16
	120	20	17	23	12	4	
							196

Former and awarded fellows commencing study on or after 1 January 2010 but no later than 31 Dec 2011							
	RA I	RA II	RA III	RA IV	RA V	RA VI	
Long-term	54	12	6	13	15	5	105
Short-term	35	1	13	22		2	73
Very Short-term	18						18
Familiarisation visits of PRs	7	1					8
	114	14	19	35	15	7	204

Overall, the trends for total numbers, distribution by Region are similar between the two periods. There are minor differences between the types of study undertaken, particularly in RA I for very short term, short term and familiarization visits. The 2012-2013 data shows the impact of the Norway funds to assist in very short term training activities

The following table shows the total number of awards as a function of year. These figures include all fellowship types. The data prior to 2009 may not correctly reflect the numbers of fellows who undertook fellowships at the US NWS desks because prior to 2009 these fellowships were handled directly by the NWS. Some of the fellows may not have been reported to the ETR Office.

Year study commenced	RA I	RA II	RA III	RA IV	RA V	RA VI	
2004	65	20	16	15	5	6	127
2005	29	14	14	13	4	6	80
2006	43	26	10	10	3	6	98
2007	38	62	8	9	10	1	128
2008	40	3	6	9	1	3	62
2009	47	6	9	5	5	3	75
2010	65	6	8	17	5	3	104
2011	49	8	11	18	10	4	100
2012	43	11	8	11	4	1	78
2013	77	9	9	12	8	3	118
	496	165	99	119	55	36	970

The following table provides information on the awarding of fellowships as a function of gender. There are generally fewer female candidates than male candidates but preference is given to female candidates. Evidence can be seen in the %awarded column where in most years the % of females taking up awards is higher than males. Overall more males get fellowships than females due to the imbalance in requests.

	Female-Awarded	Female Request	%awarded	Male-Awarded	Male Request	%awarded
2004	26	27	96	101	105	96
2005	19	20	95	60	69	87
2006	15	20	75	81	144	56
2007	33	54	61	94	158	59
2008	19	35	54	43	92	47
2009	14	34	41	60	127	47
2010	28	49	57	76	200	38
2011	19	40	48	81	166	49
2012	22	44	50	56	138	41
2013	29	67	43	87	197	44

## ***Annex VI. WMO Fellowship Programme Partners***

Institutions with whom WMO has specific arrangements for the implementation of fellowships:

- a) China (China Scholarships Council) – various institutions  
A Memorandum of Understanding (MoU) between WMO and the Ministry of Education of the Peoples Republic of China (MOE-PRC) was signed in April 2007 for cooperation in the implementation of long-term fellowships in the fields of meteorology and operational hydrology.
- b) China - Nanjing University of Science and Technology  
A Memorandum of Understanding was signed in January 2012 between WMO and the Nanjing University of Information Science and Technology (NUIST) which provides up to five scholarships per year to the WMO Members, with preference given to nominations from Least Developed and Developing Countries (LDDCs) and Small Island Developing States (SIDS).
- c) France - Météo-France  
A Memorandum of Understanding (MoU) was signed in 2014 between Météo-France and WMO to support education and training activities in the development of the knowledge and skills of personnel from the National Meteorological and Hydrological Services of least developed and developing countries, particularly French speaking countries.
- d) Germany- Leibniz Universität Hannover, Water Resources and Environmental Management  
Since late 2009 WMO has been able to support fellows from Africa, Asia, Europe the Pacific, and South America to undertake a two-year International Masters Programme in Water Resources and Environment (WATENV) at Leibniz Universität Hannover, Germany.
- e) The Netherlands - UNESCO-IHE Institute for Water Education, Delft  
WMO is partnering with UNESCO-IHE to jointly support two to three fellowships a year from developing and least developed countries to undertake an MSc in one of the agreed UNESCO-IHE programmes.
- f) Republic of Korea - (Opportunities for women at the Ewha Womans University)  
WMO entered into an agreement with Ewha Womans University in May 2012 to jointly promote education of women in meteorology. This is in actualization of the increasing importance being given to higher education for female professionals in this area so that women in developing countries are properly represented and fully integrated into the decision making process regarding these issues.
- g) Russian Federation – Russian State Hydrometeorological University (RSHU), St Petersburg  
The Government of the Russian Federation annually offers assistance for people from other countries to study at the Russian State Hydrometeorological University (RSHU) in the Russian Federation in such fields as Meteorology and Hydrology but also Ecology, Economics and Management, Oceanography.
- h) Various countries - The Academy of Sciences for the Advancement of Science in the Developing World (TWAS)  
This MoU defines cooperation in the promotion, selection and sponsorship of students and experts for advanced, full-time postgraduate training at the level of PhD in the field relevant to the interest of WMO members at any of the host institutions already included in TWAS agreements with its programme partners.
- i) United Kingdom – University of Reading



WMO is partnering with the Met Office of the United Kingdom of Great Britain and Northern Ireland (UK) to support 3 to 5 fellows per year to undertake the MSc in Applied Meteorology and Climate with Management at the University of Reading.

j) United States of America – [Attachment to Desks at the National Oceanic and Atmospheric Administration (NOAA)]

The four-month NOAA attachment provides WMO fellows with hands-on experience and training in operational weather and climate services at the National Centre for Environmental Prediction (NCEP) of NOAA. This NOAA-WMO programme is fully funded under the US contribution to the WMO-VCP and it is available for: i) African Desk [WMO Region I (Africa)]; ii) South American and Tropical Desk [NMHSs of the WMO Region III and Region IV (Americas)] and iii) Pacific Desk (NMHSs of the WMO Region V and the south-east portion of RA II).

k) Others in the offing

Efforts are ongoing to put in place bilateral agreement with the Caribbean Institute for Meteorology and Hydrology (CIMH) on short- and long-term fellowships, and the European Centre for Medium -Range Weather Forecasts (ECMWF) on short-term fellowships.

## **Annex VII. Recommend updates for the EC Criteria for the award of WMO fellowships**

1. The aim of the WMO Fellowship Programme is to support the education and training of qualified and suitable candidates, particularly from developing countries. Applications from women are especially encouraged. Fellowships should benefit both the individual candidate and the candidate's institution, usually National Meteorological and Hydrological Services (NMHSs).
2. WMO may award both short-term (less than six months) and long-term fellowships, based on recommendations of the Fellowships Committee aligned with the priorities of the ETRP
3. Candidates applying for a WMO fellowship must complete a Fellowship Nomination Form, which must be certified by the Permanent Representative of the recipient WMO Member. The Permanent Representative will specify, amongst others, the expected benefit to the individual (for example to produce a qualified workforce), and the benefit to the nominating institution (for example to assist in the organizational development of the NMHSs in the light of the changing needs of the services required to meet the evolving needs of users).
4. To be considered by the Fellowships Committee for a fellowship, candidates must:
  - (a) Be of sound health as confirmed by their completed medical certificate;
  - (b) Be proficient in, or capable of learning in, the language of study;
  - (c) Meet the entry requirements for the proposed course of study;
  - (d) Only apply for courses of study directly applicable to WMO programme areas.
5. Newly appointed directors of NMHSs are also eligible for very short-term training programmes in the management of NMHSs and for familiarization visits.
6. In awarding a fellowship, preference will be given to candidates who:
  - (a) Come from countries with least developed NMHSs as well as developing countries, countries with economies in transition and countries more vulnerable to natural disasters;
  - (b) Are supported by cost-sharing;
  - (c) Apply for courses at RTCs or other training institutions in their Region;
  - (d) Apply for short-term fellowships or long-term fellowships not exceeding 18 months in duration;
  - (e) Are expected to work and make a long term contribution in the NMHS of their country in a suitable post on completion of the fellowship;
  - (f) Have not been awarded a long-term WMO fellowship within the previous four years;
  - (g) Come from a country that has not recently benefited from a WMO fellowship.
7. In awarding a fellowship, account will be taken of:
  - (a) The need for regional proportional balance;
  - (b) The need to practice equal opportunity policies (see Resolution 33 (Cg-XIV) – Equal opportunities for the participation of women in meteorology and hydrology);
  - (c) Whether the Permanent Representative from the candidates' country has provided WMO with the required report from any previous fellowship.

## ***Annex VIII. Executive summaries of RTC assessments for Israel and Italy***

### **I. WMO RTC- Italy**

**Institute of Biometeorology (IBIMET), National Research Council, Florence, Italy (November 2013) - Dr. Timothy Spangler, Member of the EC Panel of Experts on Education and Training**

The IBIMET Regional Training Center located in Florence Italy was reviewed in November 2013 by a team representing the EC Panel.

Even though the center has not been active during the last four years as a WMO RTC, the external review team believes that the IBIMET center has a great deal of valuable education and training to offer that the WMO community desperately needs. The inactive period was a time to reassess the mission of the RTC, as well as a period of reduced funding for outreach activities. However, recent research and development has inspired new ideas and course plans for the RTC, including a Mediterranean Training Programme for Harmonizing of Early Warning Systems, and Operational Instruments for Monitoring Climate Change and Desertification. Additional courses are being considered in agrometeorology topic areas.

An additional strength of the RTC is IBIMET's collaboration with LaMMA, the Laboratory of Monitoring and Environmental Modeling for Sustainable Development, which also serves as the meteorological service for the Tuscany region and is a joint project of CNR and the Tuscany regional government. Having an operational forecasting facility co-located and as a partner strengthens the RTC. The RTC self-assessment notes that a training programme on running local public meteorological and climate services is under evaluation.

Considering these plans and the capabilities demonstrated, the review team recommends that the EC Panel of Experts on Education and Training accepted the proposal of the IBIMET Regional Training Centre to be reconfirmed as a recognized WMO Regional Training Centre.

### **Recommendations to the RTC Italy**

Previous recommendations included the need for a major effort to obtain funding to allow a greater number of courses to be offered, and more foreign students supported. While the center made progress for several years following the last review, there was a four-year hiatus prior to the review. This hiatus appears to be ended, with new course offerings already being prepared for 2014.

The review team made a number of recommendations:

- This RTC has so much to offer for Regions VI and I, and the review team encourages the centre to explore additional course offerings, including collaborations with the Italian Meteorological Service (IMS);
- The RTC has no plans to develop distance learning opportunities; Offering prerequisites and portions of courses on-line, using e-learning to keep former students up to date on recent advances, and looking for ways to offer continuous professional development would greatly extend the reach of the RTC;
- While IBIMET has a strong record of work in Africa, including 35 training sessions over the last two years, the review team was concerned that there did not seem to be adequate formal mechanisms to place to identify the training needs and priorities of Region I. While Africa is not the region that sponsors the RTC, the region can greatly benefit from the RTC offerings. These offerings could be improved and their relevance enhanced by an understanding of Region I rooted in a formal analysis of their needs.

- Collaboration with WMO CAgM and ETR might achieve such an analysis;
- While the facilities are excellent, there is currently no final plan for how to house students while they attend courses. This needs to be addressed before courses are announced;
- The RTC and IMS could benefit from regular connections to other European training organizations through membership in EUMETCAL (under EUMETNET) and participation in CALMet. For example, common needs for Agricultural and Urban Meteorology training within Europe might be identified and addressed in cooperation with Eumetcal members. Membership would also provide a mechanism for developing skills in a variety of other training approaches.

RTC	Improve communication with WMO & Members	National Service / RTC agreement needed	Resolve potential housing limitations	Increase Course Offerings	Increase no. of foreign students	Improve collaboration with other regional institutions	Increase use of DL Distance learning	Perform Region Needs Analysis
Italy								
Israel								

**Table 2. Matrix of the two assessed RTCs and areas of recommendations. Shaded cell denotes more attention required for this RTC in this area.**

## II. WMO RTC - Israel

**Bet-Dagan and CINADCO, (2 to 4 December 2013) - Dr. Timothy Spangler, Member of the EC Panel of Experts on Education and Training**

The WMO Regional Training Centre in Israel was visited by a three person review team from 2 to 4 December 2013. The review reconfirmed the scope of expertise that center has to support its operation. RTC Israel, Bet-Dagan continues to serve WMO Members from multiple regions, at a modest but steady level made possible through funding by MASHAV (Ministry of Foreign Affairs) and the use of its excellent facilities at the CINADCO center in Shefayim, north of Tel Aviv. The RTC provides free tuition and all expenses, other than travel, for students from developing nations.

For the next eight years, RTC Bet-Dagan intends to offer one or two courses per year on agrometeorology and the impact of climate change on agriculture. These courses typically focus on semi-arid countries, optimal water usage, and severe weather. All courses are in English and lecturers come from IMS, the University of Tel Aviv, the University of Jerusalem, and others.

The center is also exploring collaborations with of the Ben-Gurion Institute, located in the southern part of the country a few hours from Tel Aviv by auto. The instituted has focus areas on the use of remote sensing for comparative desertification, green building, urban micro-meteorology, and water use. They have a history of helping developing countries address these issues, and excellent facilities and nearby accommodations.

### **Summary and Recommendations**

Previous recommendations for the RTC from the 2007 review were that the center provides more courses in agrometeorology, desertification, disaster preparedness and prevention, and the socio-economic benefits of NMHS services. These topics are now explicitly addressed within its course offerings, although, other than agrometeorology, they are not addressed by unique courses.

The review team made a number of recommendations:

- This RTC was encouraged explore additional course offerings so that the centre might average at least two courses per year. These might include offerings in climate forecasting and climatology as well as aviation services since IMS recently transitioned to having responsibility for aviation forecasts and has valuable expertise to share. The RTC could also consider courses on socio-economic benefits of meteorological and hydrological services to apprise all stakeholders of the significant benefits derived from these services, as was recommended in 2007;
- Student assessment should be considered as a way to provide feedback to instructors on the effectiveness of instruction;
- If an internal course is developed as a BIP-M augmentation for working weather forecasters, consider ways that other students from the region could be invited to attend, or consider the development of distance learning resources that students from other countries could utilize to satisfy the BIP-M;
- Offering prerequisites and portions of courses via distance learning, using e-learning to keep former students up to date on recent advances, and looking for ways to offer continuous professional development would greatly extend the reach of the RTC and the expertise that exists within the IMS;
- While Africa (WMO Region I) is not the region that sponsors the RTC, the region can and does greatly benefit from the course offerings. These offerings could be improved and their relevance enhanced by an understanding of Region I rooted in a formal analysis of their needs. Collaboration with WMO CAgM and ETR might achieve such an analysis;
- The RTC should consider closer cooperation with the other two agriculture oriented RTCs in the area, Florence and Niamey, and look for ways that the three centres together could coordinate so that interested students can have access to a range of courses that meet their needs. Since RTC Bet-Dagan finds it difficult to find external evaluators within Israel, a partnership with other similar centres could provide more opportunities for external evaluation;
- The RTC and IMS could benefit from regular connections to other European training organizations through associate membership in EUMETCAL (under EUMETNET) and participation in CALMet;
- MASHAV, as a primary sponsor of the RTC activities, should be engaged through the RTC to ensure that WMO long term goals and strategies are well understood.

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## Annex IX. 2012 and 2013 RTC activities

The Panel discussed the activities of the RTCs during 2012 and 2013. Table 4.2.2 summarises the reports for the period 2012 and 2013, but also includes those from 2010 and 2011 for comparison. The Panel noted that in 2012, 18 of the 26 WMO-RTCs reported, in 2014, 23 of 26 RTCs reported (data for RTCs with multiple components, such as Russia and China, were aggregated).

The Panel noted with concern that no reports were received from the RTCs in Angola and Venezuela for the past seven years. In addition, Iran failed to submit a report for the period of 2012-2013 but have been working with the ETR Office to offer courses. Italy did not submit a formal report, but did submit an RTC self-assessment.

The Panel noted that the number of courses and participants included in the table include long term MSc, BSc and Technician courses and also short and very short-term (<1 month) courses in fields such as meteorology, climatology, agro-meteorology, aeronautical meteorology, weather forecasting, hydrology, water resources management, satellite meteorology, numerical weather prediction and meteorological instruments. Course delivery included face-to-face and online. The Panel noted that due to inconsistencies in how some of the centres reported courses, these numbers should be used as relative indicators only. The Panel requested the ETR Office to improve the reporting sheets to reduce these inconsistencies in the future.

	2010 & 2011			2012 & 2013		
WMO Member	Local Participants	Foreign Participants	No. Courses*	Local Participants	Foreign Participants	No. Courses*
<b>Region I</b>						
Algeria	41	3	6	512	50	4
Angola	–	–	–	–	–	–
Egypt	404	90	41	402	83	14
Kenya	90	66	15	64	255	9
Madagascar	120	9	10	203	18	-
Niger	31	322	18	28	497	-
Nigeria	339	8	5	493	11	-
South Africa	**	**	**	692	213	8
<b>Region II</b>						
China	214	409	37	325	801	35
India	5	1	1	557	36	-
Islamic Rep. of Iran	4	4	4	–	–	-
Iraq	86	0	9	0	0	-
Qatar	**	**	**	77	224	3
Uzbekistan	30	0	2	113	3	1
<b>Region III</b>						
Argentina	1,129	113	98	976	14	1
Brazil	733	0	2	723	0	--
Peru	**	**	**	160	21	-
Venezuela	–	–		–	–	-

<b>Region IV</b>						
Barbados	–	–	–	187	301	4
Costa Rica	–	–	–	32	16	
<b>Region V</b>						
Indonesia	**	**	**	39	28	
Philippines	550	6	21	58	8	
<b>Region VI</b>						
Israel	0	52	3	3	47	2
Italy	–	–	–	0	0	4
Russian Federation	1,649	178	71	1699	254	20
Turkey	78	210	14	116	353	8
<b>TOTAL</b>	<b>5,503</b>	<b>1,471</b>	<b>351</b>	<b>7,449</b>	<b>3,233</b>	<b>113</b>

\* Number of courses includes both long-term, short-, and very short-term courses.

\*\* Indicates that this RTC was not yet confirmed.

**Table 4.2.2. Summary of RTC course details for 2010 through 2013**

The Panel noted that the figures in Table 4.2.2 indicate the RTCs that are actively involved in the training of foreign students and therefore fulfilling the main requirement in their roles as RTCs. The table shows that the number of foreign students served by RTCs has more than doubled between 2010/11 and 2012/13 (an increase of approximately 1.8 the earlier period). The Panel discussed the reasons for this significant increase. Ten of the RTCs increased the number of foreign students they served, CIMH (RTC Barbados) and UCR (RTC Costa Rica) did not provide reports for 2010/11 but did serve foreign students. Also, the new RTCs in South Africa, Qatar, and Peru contributed 458 to the number of foreign students served. Together, these new reports and newly active centres account for 44 percent of the increase.

The Panel noted that 8 centres served 10 or fewer foreign students, with 3 centres serving none. Six RTCs: China, Niger, Turkey, Barbados, Russia, and Kenya served approximately 75% of the total foreign students. In addition, Niger, Qatar, Barbados, Israel, and Turkey had more foreign students than local students. (The Panel recalled that the RTCs in Niger and Barbados were established primarily as regional facilities rather than national facilities).

The Panel observed that the ETR Office also sponsors students to attend courses offered by other training institutions that play a significant role in the broader ETR Programme. These centres include Meteo France - ENM, University of Reading, Hong Kong Observatory, Oman, and Korean Meteorological Administration, which together served an additional 16 foreign students. In addition countries such as France, Hong Kong China and the United Kingdom all provided very short term training courses and financial support under their VCP programmes.

The level of education and training activities reported by RTCs in Table 3 are very positive when considered against the 2010-2011 activities. What is not so clear is how well these address the demands in the five high priority areas for this financial period; (a) Global Framework for Climate Services, (b) Aviation Meteorological Services, (c) Capacity-building for the Developing and Least Developed Countries, (d) Implementation of the WMO Integrated Global Observing System (WIGOS) and WMO Information System (WIS), and (e) Disaster Risk Reduction. This additional reporting requirement may need to be considered for the next reporting period.

#### RTC Distance Learning Activities

Distance learning offerings by RTCs are increasing significantly in terms of the numbers of participants. In total, 18 distance learning courses were offered by RTCs in the reporting period. Approximately 279 foreign students were served in these DL courses. The table below summarizes the variety of DL activities that took place in 2012 and 2013.

Russia :
<ul style="list-style-type: none"> <li>• 2 Webinars (including a virtual roundtable on aeronautical competencies)</li> <li>• Creation of distance learning system for professional development, including holding virtual classes on design and development of web-based learning</li> </ul>
India
<ul style="list-style-type: none"> <li>• 2 offerings of the DL Basic Hydrological Sciences course (6 weeks)(Indian audience only)</li> <li>• DL Basic Hydrological Sciences for RA-II (26 of 39 students international)</li> <li>• 4 new distance learning modules (self-paced) developed for use in the above courses</li> </ul>
Barbados
<ul style="list-style-type: none"> <li>• DL Aeronautical CPD course: 2 offerings, (total: 20 foreign students, 4 local)</li> <li>• Virtual Round Table on aeronautical competencies</li> <li>• Monthly regional focus groups (online weather briefings)</li> <li>• Basic Surface Water Modeling DL Course (17 foreign students)</li> </ul>
Peru
<ul style="list-style-type: none"> <li>• Climandes project is developing DL modules, with U of Bern, Switzerland</li> </ul>
Costa Rica
<ul style="list-style-type: none"> <li>• DL Course on Aeronautical Meteorology for Observers (6 foreign students)</li> </ul>
Argentina
<ul style="list-style-type: none"> <li>• Course development for DL Introduction to Meteorology (25 regional students)</li> <li>• Conceptual Models for Southern Hemisphere project (with EUMETSAT)</li> </ul>
Kenya
<ul style="list-style-type: none"> <li>• DL Basic Hydrologic Sciences course (52 foreign students)</li> <li>• E-SAC course (with EUMETSAT) DL Phase (25 foreign students)</li> <li>• ASMETS Projects development</li> </ul>
Niger
<ul style="list-style-type: none"> <li>• E-SAC (with EUMETSAT) DL Phase (18 foreign students)</li> <li>• ASMETS Projects development</li> </ul>
South Africa
<ul style="list-style-type: none"> <li>• 2 offerings DL for Aviation forecasters (81 local, 46 foreign students)</li> <li>• 2 offerings DL for Aviation observers (239 local, 44 foreign students)</li> <li>• 1 offering DL for Electronic instrument maintenance (120 local)</li> <li>• SATrep Online sessions (weather briefings), monthly in 2012 (regional/international)</li> <li>• ASMETS Projects development</li> <li>• DL lecture on Tropical Met (to Kenya)</li> <li>• Conceptual Models for Southern Hemisphere project (with EUMETSAT)</li> </ul>

**Table 4 Distance learning activities by RTCs**



**Annex X. Additional information supporting the key recommendations and outcomes from the Task Team on RTCs**

**Summary of the reasons for the recommendations of the Task Team  
(Appendix K of the full report)**

<b>Short description of the options</b>	<b>Overall assessment</b>
A. Carry on with business as usual for the RTC network	<ul style="list-style-type: none"> <li>• Not an effective use of resources.</li> <li>• Does not address ineffectiveness of some RTCs.</li> <li>• Will not contribute to meeting increased demands.</li> </ul>
B. Remove all RTC designations	<ul style="list-style-type: none"> <li>• Though some institutions would continue with the same level of international activity, overall there would be a reduction in capacity for international students.</li> <li>• Would be disruptive and interfere with current activities.</li> <li>• Probably politically unacceptable.</li> <li>• Loss of RTC status might affect the resourcing of some institutions.</li> <li>• Will not contribute to meeting increased demands.</li> </ul>
C. Improve the existing network	<ul style="list-style-type: none"> <li>• Previous efforts to improve the effectiveness of the RTC network have had only limited success.</li> <li>• Improving the effectiveness of low performing RTCs would enhance the ability to meet regional training needs.</li> <li>• Builds on existing good practice</li> <li>• Might encourage a greater degree of collaboration and sharing of resources between RTCs.</li> <li>• Could provide potential users of RTCs with greater confidence about the quality and relevance of the training that is on offer.</li> <li>• Only makes partial contribute to meeting increased demands.</li> </ul>
D. Reclassify all existing RTCs as a WMO National Training Centres with institutions then reapplying to be RTCs	<ul style="list-style-type: none"> <li>• Though some institutions would continue with the same level of international activity, overall there would be a reduction in capacity for international students.</li> <li>• Would be a disruptive and bureaucratic process, and interfere with current activities.</li> <li>• Probably politically unacceptable.</li> <li>• Might alienate effective RTCs.</li> <li>• Will not contribute to meeting increased demands.</li> </ul>
E. Transfer all responsibilities for RTCs to Regional Associations	<ul style="list-style-type: none"> <li>• Would encourage Regional Associations to identify their training requirements and likely to make RTCs more responsive to addressing those requirements.</li> <li>• More involvement from Regional Associations that had responsibility for initiating the establishment of the RTCs.</li> <li>• Regional Associations might not have the capacity to carry out all the required tasks.</li> <li>• Could be a lack of consistency and independence in the</li> </ul>

	<p>monitoring process.</p> <ul style="list-style-type: none"> <li>• Would limit the spreading of good practice amongst the whole of the RTC network.</li> </ul>
F. Establish RTCs using the concept of CIMH	<ul style="list-style-type: none"> <li>• Though this is a highly effective model of governance and financing, for most existing RTCs there are not the regional or sub-regional political structures available to support this approach.</li> <li>• Imposing this model on all existing RTCs or new ones would leave few RTCs and thereby reduce capacity to meet current and future training requirements.</li> </ul>
G. Establish the WMO Global Campus	<ul style="list-style-type: none"> <li>• Many of the foundation elements of the Global Campus (promotion of collaboration, sharing of resources, better access to information and resources) could be provided by a fully effective RTC network.</li> <li>• The RTCs could be major contributors to and users of the Global Campus.</li> <li>• Concerns still exist about the overall vision, governance, financing and inclusiveness of the Global Campus.</li> <li>• News sources of funding are likely to be required to establish and maintain the Global Campus.</li> <li>• Would make a significant contribution to meeting increased demands.</li> </ul>

**Annex XI. *Draft of responsibilities Regional Association, the Permanent Representative of the host country, the Director of the Training Centre and the Secretary-General***  
(Appendix L of the full report)

In designating an RTC, the Regional Association, the Permanent Representative of the host country, the Director of the Training Centre and the Secretary-General take on the following roles and responsibilities. The performance and ongoing status of the institution(s) as an RTC is dependent upon each of the parties carrying out their roles and addressing their responsibilities. Failure of one party to carry out its role could jeopardise any subsequent reconfirmation.

*Regional Association*

- Provide prioritised regional training requirements to the RTCs, taking into account the area of expertise of each of the RTCs.
- Keep abreast of the activities and plans of each RTC and its components via the annual report they provide.
- Provide feedback to the RTCs, Members and Secretary-General on whether the RTCs are meeting the needs of the Regional Association.
- Contribute to reviews of the RTCs carried out by the Executive Council Panel of Experts on Education and Training, particularly aspects addressing the degree to which the RTCs are meeting the identified needs of the Regional Association.
- At each session consider whether to recommend to WMO Executive Council the reconfirmation of existing RTCs.
- Recommend nominations for new RTCs to the WMO Executive Council based on an assessment of whether the requirements to be recognised as an RTC are going to be met and noting the cost and resource implications to Members of increasing the number of RTCs.
- Promote the activities and use of the RTCs by members.
- Seek funding and resource opportunities to support and expand the work of the RTCs in addressing the Regional Association's education and training needs.

*Permanent Representative of the host country*

- Designate the Director of the RTC and inform the Secretary-General and the Regional Association of contact details and any changes.
- Ensure coordination between the RTC and the Regional Association regarding regional training needs, funding and resource opportunities.
- Promote the resourcing of the RTC through support from government and other national and international funding bodies.
- Ensure that the RTC provides annual reports about its activities in the previous 12 months and its plans for the next 18 months to the Regional Association and the Secretary-General.
- If the RTC has multiple components, promote collaboration between those components.
- Collaborate with other Permanent Representatives hosting RTCs to promote collaboration between the RTCs.
- Ensure adequate staffing of the RTC and that the personnel are appropriately qualified.
- Ensure continuous upgrading of education and training facilities in tandem with technological development to enable the RTC fulfil its obligations in a changing environment.

- Where the RTC is composed of multiple institutions, ensure ongoing communication and coordination between the institutions to maximise education and training opportunities for Members.
- Oversee the quality control measures used by the RTC to ensure they comply with national and WMO standards and guidelines.

*Director of an RTC with a single component*

- Monitor and plan the RTC's activities in accordance with the expressed needs of the Regional Association.
- For vocational training activities, use processes within the RTC that are consistent with ISO 29990:2010 (*Learning services for non-formal education and training – Basic requirements for service providers*) in terms of identifying learning needs, developing and delivering of learning content, evaluating learning and administration, and managing the learning service.
- Ensure RTC staff continue to maintain and develop their professional and training expertise.
- Provide annual reports about the RTC's activities in the previous 12 months and plans for the next 18 months to the Regional Association with a copy to the Secretary-General.
- Promote the RTC's services and courses to Members through regular communication and provide Members with easy access to the RTC's training programme and contacts.
- Collaborate with other RTCs to share resources and experiences in addressing regional training needs.
- Seek additional funding and resource opportunities to expand the ability of the RTC to address the regional education and training needs.

*Director of an RTC with multiple components*

- Coordinate the overall activities of the RTC components in accordance with the expressed needs of the Regional Association.
- For vocational training activities, ensure that the processes used by the RTC components are consistent with ISO 29990:2010 (*Learning services for non-formal education and training – Basic requirements for service providers*) in terms of identifying learning needs, developing and delivering of learning content, evaluating learning and administration, and managing the learning service.
- Provide annual reports about the RTC's activities in the previous 12 months and plans for the next 18 months to the Regional Association with a copy to the Secretary-General.
- Oversee and coordinate arrangements for (a) promoting and providing information about and the RTC's services and courses to Members through regular communication, and (b) coordinating with other RTC components and RTCs to ensure sharing of resources and experience in addressing regional training needs.
- Ensure the components of the RTC collaborate and each is appraised of the other's education and training activities.
- Support the RTC components in seeking additional funding and resource opportunities to expand the ability of the RTC to address the regional education and training needs.

*Director of an institution which is part of an RTC with multiple components*

- Monitor and plan RTC component's activities in accordance with the expressed needs of the Regional Association.
- For vocational training activities, use processes within the RTC component that are consistent with ISO 29990:2010 (*Learning services for non-formal education and training – Basic requirements for service providers*) in terms of identifying learning

- needs, developing and delivering of learning content, evaluating learning and administration, and managing the learning service.
- Ensure RTC component staff continue to maintain and develop their professional and training expertise.
  - Provide annual reports about the RTC component's activities in the previous 12 months and plans for the next 18 months to the RTC Director.
  - Promote the RTC component's services and courses to Members through regular communication and provide Members with easy access to the RTC component's training programme and contacts.
  - Maintain regular communication on RTC activities with the other RTC components in the host country to maximise education and training opportunities for Members.
  - Coordinate with other RTCs and RTC components to ensure sharing of resources and experience in addressing regional training needs.
  - Seek additional funding and resource opportunities to expand the ability of the RTC component to support the regional education and training needs.

*Secretary-General*

- Promote the work of the RTCs by seeking to hold as many Secretariat supported training events using RTC facilities and capabilities.
- Support the maintenance and development of the professional and training expertise of RTC staff taking into account existing capabilities in the host countries and regional priorities.
- Support the Regional Associations in the establishment, monitoring and review of RTCs.
- Provide opportunities for RTC coordination and support within resource constraints.
- Promote education and training opportunities in RTCs to Members.
- Promote, support and facilitate collaboration amongst RTCs and between RTCs and other training partners.
- Coordinate training opportunities and issues within the Secretariat related to RTCs.
- Promote relationship between RTCs and Regional Associations.
- Seek additional opportunities to support the RTCs in addressing Member needs.
- Facilitate and support RTCs in seeking research funding from donors.

**(a) Draft of revised conditions to be designated or reconfirmed as an RTC  
(Appendix M of the full report)**

A Regional Training Centre (RTC) is a national education and training institution, or group of institutions in that country, recognised by the relevant WMO Regional Association(s) as:

1. Providing education and training opportunities for WMO Members, particularly NMHS staff;
2. Supplying advice and assistance on education and training matters to WMO Members; and,
3. Promoting education and training opportunities in weather, water and climate for WMO Members.

These activities are undertaken in accordance with WMO regulations and guidelines. An institute supported by multiple countries to provide such services could also be recognised by the relevant Regional Association as an RTC.

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:

1. A Centre is established only to meet the expressed requirements of more than half of the Members of the Regional Association that cannot be met by existing resources;
2. 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, though it is recognised that some RTCs might also take on a broader international remit;
3. 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, 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:

*Identifying learning needs*

- The Centre has processes in place to gain information about the training needs of the Region.

*Designing the learning service*

- The Centre selects methods of learning, including e-learning where appropriate, that respond to the aims and requirements of the curriculum and learning outcomes, and are appropriate for the learners.
- The Centre ensures that its various courses of instruction and other activities (e.g. delivering/developing e-learning, running off-site activities and providing advice/support) are carried out in a way that is consistent with the standards and guidance material issued by WMO.
- The Centre provides courses and other activities that address the expressed needs of the Region.

*Delivering the learning service*

- The Centre has the experience and capability to carry out the education and training for personnel from Member countries.
- The Centre has an environment which is conducive to learning with adequate learning resources, buildings, IT systems and training facilities.

*Assessing learning and evaluating the learning service*

- The Centre assesses the knowledge and competency of students, documents this information in a fashion suitable for a recognized quality management system, and

provides students with a record of the education and training that has been successfully completed.

- The Centre has processes in place to (a) obtain feedback from learners about learning methods, resources and facilities and (b) for measuring the effectiveness and quality of the learning service.

*Administering and managing the learning service*

- The Centre has in place quality control mechanisms consistent with a recognised quality management framework.
- If the Centre has no national accreditation as a provider of vocational training, the Centre can demonstrate that it carries out its vocational training activities in accordance with the requirements of ISO 29990:2010.
- The Centre produces a rolling 18-month plan which is provided to the relevant Regional Association before the commencement of the each calendar year.
- The Centre is open to students from all countries in the region and, subject to availability of resources, to interested countries in other regions.
- The Centre has competent instructors in terms of their technical ability and training expertise, and ensures staff undertake continuous professional development;
- The Centre has adequate arrangements for administration, governance, planning and self-assessment.
- The Centre has appropriate services in place to support international/regional students.

**(b) Suggested contents for RTC Handbook (Appendix N of the full report)**

*Elaboration on information in the WMO Technical Regulations*

- Purpose of RTCs
- Process and criteria for designation and reconfirmation of RTC status
- Different models for RTCs
- Roles and Responsibilities of parties involved in an RTC
- Planning and reporting requirements

*Considerations for managing and administration of an RTC*

- Accreditation and certification
- Identifying regional needs
- Resource implications for different options for education and training delivery
- Balancing national and international requirements
- Resource mobilization
- Monitoring and evaluation of courses
- Maintaining and developing the professional and training expertise of members of staff
- Using ISO 29990:2010 and WMO Guidelines for Trainers (WMO-1114) to create and monitor vocational training processes
- Promoting the RTC nationally and internationally
- Technology and infrastructure considerations
- Keeping track of past students and having them assist in promotion and resource mobilization
- Collaborating with other RTCs
- Working with national and international partners

*Dealing with WMO*

- Introduction to WMO
- How to work with WMO to enhance and promote the RTC's activities
- Fellowships
- Training activities (e.g. announcing courses, training and developing staff, and seeking support)
- What support can I expect?

*Annex*

- Draft agreement between WMO and the hosting country



**(c) Some important issues not yet resolved**

- To what extent should universities that are part of the RTC network follow ISO 29990:2010 (Learning services for non-formal education and training – Basic requirements for service providers) for educational activities?
- How will the reconfirmation process work when an RTC is active in providing training to students from outside its own region(s) along with those from within the Regional Association(s) in which the RTC is based?
- Is an eight year review period for RTCs too long, bearing in mind the rapid changes in technology, service provision and scientific knowledge?
- For a new RTC with provisional status, will a follow-up visit be required (e.g. by someone from the ETR Office) before its RTC status can be confirmed?
- Instead of a “Provisional RTC” having RTC designation removed if it has not fully addressed any weaknesses after two years, would it be more appropriate for EC to suspend the RTC in that circumstance and then remove RTC designation if the RTC cannot demonstrate it fully satisfies the requirements to be an RTC after a further two years?
- To what extent do the Regional Associations have the capabilities and resources to take on additional responsibilities concerning the RTCs?
- If Regional Associations are going to be more active in their relationship with the RTCs, what affect will this have on the decision process for allocating WMO fellowships in a way that best serves the training needs of the region?
- To what extent should all RTCs be expected to have the expertise and IT capability to develop and deliver e-learning?
- Should the conditions for reconfirmation of an RTC include something about the amount of training provided to international/regional students in recent years (e.g. number of people trained or person months of training)?
- Should the Task Team on future roles and operations of WMO RTCs have a role in the feasibility study?
- What should be included in a revised version of the part of the Technical Regulations WMO 49, Vol 1, about WMO Regional Training Centres?

## Annex XII. RTC EXTERNAL ASSESSMENT PROGRAMME

Year	RTC Host	Dates	Convenor
2008	Costa Rica	14-15 March 2008	Dr. Timothy C. SPANGLER
	Egypt	25-27 November 2008	Dr. Ahmed LAGHA
2009	Barbados	2-6 March 2009	Mr. Kent JOHNSON
	Argentina	5-7 May 2009	Dr. Vilma CASTRO
	Kenya	12-14 October 2009	Mr. Julius WELLENS-MENSAH
	Madagascar	11-13 November 2009	Mr. Christophe BILLARD
2010	Philippines	2-5 November 2010	Mr. Chris WEBSTER
2011	India	21-28 March 2011	Ms. Meihua WANG
	Uzbekistan	12-15 April 2011	Mr. Christophe BILLARD
	China	26-29 April 2011	Dr. Vilma CASTRO
	Russian Fed.	6-11 June 2011	Dr. Gustavo NECCO
	Turkey	5-8 December 2011	Mr. François LALAURETTE
2012	Niger	Second half of 2014	Mr Didier Reboux
	Italy	November 2013	Dr Tim Spangler
	Algeria	Second half of 2014	Mr Didier Reboux
2013	Venezuela	Second half of 2014	Dr. Vilma CASTRO
	Nigeria	First half of 2015	Dr. Winifred Jordaan
	Brazil	Not required as PR withdrew RTC designation	Dr. Claudia Competella
2014	Israel	November 2013	Dr. Tim Spangler
	Angola	First half of 2015	Mr. Benoit Sarr or Portuguese rep
	Iran, Islamic Rep. of	First half of 2015	Mr Biswajit MUKHOPADHYAY
2015	Iraq		

**Annex XIII. CURRENT WMO RTCS**

<b>AGREEMENTS BETWEEN WMO AND MEMBERS HOSTING RECOGNIZED RTCS</b>		
<b>COPIES ON FILE</b>		
1	RTC Angola	31 July 1984
2	RTC Barbados *	12 June 2009
3	RTC Brazil *	13 July 1984
4	RTC China *	14 June 1984
5	RTC Egypt	12 June 2009
6	RTC India *	15 June 1988
7	RTC Islamic Republic of Iran	14 June 1994
8	RTC Israel	26 April 1995
9	RTC Italy *	23 February 1984
10	RTC Madagascar *	10 October 2011
11	RTC Peru	15 July 2011
12	RTC Philippines *	5 August 2011
13	RTC Qatar	17 March 2011
14	RTC Russian Federation *	25 January 1995
15	RTC South Africa	8 December 2011
16	RTC Turkey	18 May 2000
17	RTC Uzbekistan	19 September 1994
18	RTC Kenya *	14 November 2012
<b>COPIES NOT ON FILE</b>		
1	RTC Algeria	1973
2	RTC Niger **	1975
3	RTC Nigeria *	1967
4	RTC Iraq	1976
5	RTC Argentina *	1966
6	RTC Venezuela *	1975
7	RTC Costa Rica *	1968
*	With University component	
**	2 RTCs	

## **Annex XIV. EC-PANEL 26 ACTIONS**

	<b>Action</b>	<b>Who</b>	<b>When</b>
1	Complete Final report	D/ETR	Early to mid May 14
2	Complete EC-66 ETR paper	D/ETR	Late April 2014
3	Prepare RTC Handbook	D/ETR	Draft for review by Cg-17
4	Progress RTC inspections	C/TRA	As per schedule
5	Develop material on Global Campus for EC-66, including suggested names for steering committee	Aileen Semple	Prior to EC-66
6	Prepare capability profiles	Ian Lisk with assistance D/ETR and Roger Deslandes	Prior to Cg-17
7	Update the RTC activity report	C/TRA	End of 2014
8	Continue collection and development of Member staffing profiles and capabilities	D/ETR	Ongoing
9	Update action list for RTC future role and recommendations after EC-66	D/ETR and Chair	31 July 2014
10	Set up WMO Global Campus steering committee and meetings after EC-66	Chair, D/ETR and Aileen Semple	31 July 2014
11	Refine the ETR KPI's and survey questions with EC-WG on SOP and Strategic Planning Office	D/ETR, C/TRA and Chair	31 Dec 2014
12	Coordinate with Technical Commissions re competency structure and wording	D/ETR and C/TRA	31 Dec 2014
13	Coordinate with RAs and TCs to refine ETR needs and priorities	Panel members and Secretariat	Cg-17

## **Annex XV. Feasibility study of the Global Campus**

Consideration of the Global Campus was included in the original set of options because it is envisaged that RTCs would potentially be major contributors to and users of a WMO Global Campus. Also it appears that if the Global Campus was established it could make a significant contribution to meeting the expected increase in demand for training by WMO Members over the next ten years.

The Global Campus concept was raised at SYMET-XII in September 2013 and further elaborated via the Symposium forums. At the Symposium there was interest in, and concern about, the proposal regarding the overall vision, governance, financing and inclusiveness. However, it is recognised that the foundation elements of the proposal (promotion of collaboration, sharing of resources, and better access to information and resources) are consistent with the actions recommended to enhance the effectiveness of the current RTC network.

Arrangements have been made by the UK to second an expert to the WMO ETR Office who would be available to work on matters such as these.

It is recommended that a feasibility study of the Global Campus be run from within the ETR Office under the auspices of the EC Panel with an advisory committee that involves potential users and contributors (including representation from Directors of existing RTCs) to advise on ways to stimulate and test the idea of a Global Campus.

The aim would be to complete an initial feasibility study to provide the meeting of Congress in May 2015 (Cg-17) with a report on the feasibility, desirability and suggested roadmap of implementing the Global Campus. The initial feasibility study could (a) elaborate on the vision and how the Members would benefit from the Global Campus, (b) provide further details on areas such as governance, quality control mechanisms and resources required for successful implementation and ongoing sustainability and (c) prepare a roadmap for the next stage in the development of the Global Campus concept. The feasibility study might include all or some of the following.

- Building clarity of the concept of the Global Campus and the potential benefits amongst WMO Members.
- Investigating options to develop a trial Global Campus registry of resources and activities, exploiting where possible an existing registry, and exploring how the Global Campus could utilize the capabilities of WIS.
- Establishing basic criteria for partners and providers to list resources and activities on the registry and developing ways to actively solicit and encourage organizations to offer their resources to WMO Members.
- Testing new arrangements/processes that have the potential to provide more resources in multiple languages at modest cost.
- Investigating ways to assure the quality of resources and activities available via the Global Campus.
- Examining issues surrounding the acceptance of courses and credits from a dispersed set of providers by surveying representative users.

- Engaging with at least one new global partner as a way of increasing the capacity for WMO education and training activities.
- Seeking new resources for supporting education and training, especially in climate services and hydrology, that can be made available to WMO Members.
- Examining and testing ideas for providing training and support to RTCs so that they could (a) make an increasing contribution to providing resources, particularly for e-learning, to the Global Campus and (b) benefit from the resources available via the Global Campus.
- Identifying and recognising potential constraints/challenges in the implementation of the Global Campus and where possible, propose ways of overcoming them
- Identifying the human and financial resources required, along with possible resourcing arrangements, for implementation of the Global Campus in terms of both initiation and maintenance.

If Cg-17 decides that implementation of the Global Campus is both feasible and desirable and approves the suggested roadmap, development of the Global Campus concept along with implementation of Option C would be a key aspect of the ETR Programme in the inter-sessional period leading to Cg 18 in 2019. Subject to approval at Cg18, a full implementation of the Global Campus would commence.

Action items from 26<sup>th</sup> session of the EC Panel of Experts on ETR

The Chair suggested this would provide an excellent opportunity to reflect on the successes and challenges over five decades for a publication such as the WMO Bulletin.  
(Action 1)