

WORLD METEOROLOGICAL ORGANIZATION

**COMMISSION FOR INSTRUMENTS
AND METHODS OF OBSERVATION**

TASK TEAM ON COMPETENCIES

First Session

(TT-Comp-1)

Casablanca, Morocco

10-13 November 2014

FINAL REPORT



DISCLAIMER

Regulation 43

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 44

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 on 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).

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EXECUTIVE SUMMARY

The first session of the CIMO Task Team on Competencies was held at the Direction de la Météorologie Nationale (DMN), Casablanca, Morocco, from 10 to 13 November 2014, and the kind invitation of the Permanent Representative of Morocco with WMO, Dr Mokssit.

The primary objectives of the session were to:

- Determine the overall requirements for competency framework development for the instruments and methods of observation area;
- Derive draft competencies for meteorological observations;
- Review and revise the draft competency framework for Instrument Calibration previously developed by the CIMO Expert Team on Regional Instrument Centres, Calibration and Traceability (ET-RIC).

The session was expertly facilitated by Dr Ian Bell, who had played a key role in the development of other competency frameworks for WMO in collaboration with the WMO Education and Training Department. Dr Bell commenced the session with an introductory presentation on the need for WMO competency frameworks, and the form that these should take. He then reviewed progress to date in the development of competency frameworks for other WMO programme areas.

Each of the participants next provided brief presentations on the development of competency frameworks within their own organizations, before the Task Team turned to the main work of its session.

The session first proposed that four separate competency frameworks would be required to cover the breadth of the instruments and methods of observation area:

- A Competency Framework for Meteorological Observations;
- A Competency Framework for Instrumentation;
- A Competency Framework for Instrument Calibration;
- A Competency Framework for Observing Network and Programme Management.

The participants then focused on the development of a draft Competency Framework for Meteorological Observations. They first developed the set of High Level Competencies (HLCs) required to cover this functional area, then provided description of each of these HLCs, the performance components of each and the accompanying knowledge and skills requirements.

Next, the Task Team reviewed the draft Competency Framework for Instrument Calibration developed by ET-RIC and presented to the session by Mr Rabia Merrouchi, the Task Team's OPAG Chair. The session recommended a restructure of the framework to bring it in line with other WMO competency frameworks, and proposed a set of alternative HLCs to cover this area. Mr Merrouchi agreed to rederive the framework using the proposed structure.

The Task Team then devoted the time remaining in the session to progress its work beyond that originally planned for the meeting. It developed HLCs for Meteorological Instruments and for Observing Programme and Network Management, then commenced the derivation of detailed competency descriptions and the performance components for each, agreeing to complete this work by correspondence after the session. Finally, the Task Team updated its Work Plan.

AGENDA

1. ORGANIZATION OF THE SESSION

- 1.1 Opening of the Session
- 1.2 Adoption of the Agenda
- 1.3 Working Arrangements of the Session

2. PURPOSE OF THE SESSION: WHAT ARE COMPETENCIES AND WHY DO WE NEED THEM?

3. BACKGROUND: EXISTING COMPETENCY FRAMEWORKS

- 3.1 WMO Competency Frameworks
- 3.2 WMO CIMO Calibration Competency Framework
- 3.3 Status of Existing National Competency Frameworks

4. CIMO REQUIREMENTS FOR COMPETENCIES

- 4.1 Overall CIMO Competency Requirements
- 4.2 Detailed Competencies for Instrument Calibration
- 4.3 High Level Competencies for Observers
- 4.4 Detailed Competencies for Observers

5. SUMMARY & CONCLUSIONS

6. DRAFT REPORT OF THE SESSION

7. CLOSURE OF THE SESSION

GENERAL SUMMARY

1. ORGANIZATION OF THE SESSION

1.1 Opening of the Session

1.1.1 The first session of the CIMO Task Team on Competencies was held at the headquarters of the Meteorological Service of Morocco in Casablanca, Morocco, at the kind invitation of Dr Mokssit, the Permanent Representative of Morocco with WMO. The session was opened on Monday 10 November 2014 at 9:30am, by its Chair, Mr Buhle Shandu, who welcomed the participants to Casablanca.

1.1.2 Dr Mokssit then welcomed the participants to Casablanca on behalf of his organization. He expressed his honour in hosting the meeting in Casablanca, noting that the subject of the meeting had particularly relevance for capacity development. He invited the participants to make the most of their time in Casablanca and to feel free to interact with his staff to learn more of the Meteorological Service of Morocco and how it conducts its business. He welcomed suggestions on how his organization could improve the services it provides. In closing, he wished the participants an enjoyable and successful meeting and urged them to make the most of their time in Morocco by experiencing also the culture and cuisine of his country.

1.1.3 Dr Rüedi thanked Dr. Mokssit for his kind words, noting the advantage of holding the meeting in Casablanca to capitalize on the presence of Dr Bell and Mr Merrouchi, each of whom has considerable knowledge and experience in the development of competencies for WMO. Dr Rüedi commended the Meteorological Service of Morocco for taking a lead role in the implementation of WIGOS in Africa. She wished the participants a successful meeting. The list of participants is at [Annex I](#).

1.2 Adoption of the Agenda

1.2.1 The Agenda for the session was adopted as reproduced at the beginning of this report.

1.3 Working Arrangements for the Session

1.3.1 The working hours and tentative timetable for the meeting were agreed upon.

2. PURPOSE OF THE SESSION: WHAT ARE COMPETENCIES AND WHY DO WE NEED THEM?

2.1.1 To set the scene for the session, Dr Bell described his previous experience in the development of competency frameworks for WMO. He noted that this commenced with the development of competencies for severe weather services staff many years ago and that he had since been involved in the development of several additional sets of competencies for WMO.

2.1.2 Dr Bell stressed that the key to developing competencies was to be pragmatic, and not to waste time on extraneous details. He cited the case of the development of competencies for tsunami warning and how at first, an understanding of the observing instrumentation had been suggested as a required competency, but on reflection it had been concluded that this was unimportant: the key was to be able to warn of a coming tsunami. He suggested that in the development of competencies for the instruments and observations area, the team should start with by being pragmatic and work back to the theory only as required. As a second example Dr Bell described the curriculum of his next climate course as being centred on being able to respond to media questions, rather than know about climate change, per se. By stripping away unnecessary aspects, the development of competencies becomes a relative simple process:

competencies are simply about what one needs to do in practice to perform a particular job competently. They will then provide valuable information to trainers on what to teach.

2.1.3 Dr Bell likened competencies to 'enabling skills'. The need for them is becoming widely recognized. Cg-XVI recommended that all technical commissions make the development of competence standards for the core job-tasks in meteorology and hydrology a high priority activity and incorporate this task into their current work programmes. Well-framed competency specifications enable international consistency in service delivery by establishing a global standard, they ensure that staff are appropriately skilled and are not asked to do what they're not trained to do, and they form the basis of focused training. They help to identify weaknesses and gaps in training and also help with the appropriate allocation of resources.

2.1.4 Dr Bell described the attributes of a well-specified competency:

- It must reflect what people are actually required to do on the job;
- It should be specified in terms of the highest cognitive functions;
- It should be simple but not overly simplified: no extraneous words or redundancies, include an active verb;
- It should be demonstrable and assessable.

If all required competencies are specified, then someone will be fully functioning in their job if they meet them all. People will know what is expected of them and we will be confident that they can deliver.

3. BACKGROUND: EXISTING COMPETENCY FRAMEWORKS

3.1 WMO Competency Frameworks

3.1.1 Dr Atkinson then briefed the session on the competency frameworks that had already been developed by WMO and briefly discussed their perceived strengths and weaknesses. Those described were:

- Competencies Framework for PWS Forecasters and Advisors:
<http://www.wmo.int/pages/prog/dra/etrp/linkedfiles/PWSCompetencyFramework.docx>
- Competency Requirements for Education and Training:
https://googledrive.com/host/0BwdvoC9AeWjUazhkNTdXR XUzOEU/wmo_1114_en.pdf
- Competencies for Aeronautical Meteorological Personnel:
<https://docs.google.com/file/d/0B50bTmQtOwH6bU1HTFV4ZIQ4YUU/edit?usp=sharing>
- Competency Requirements for WMO Information System (WIS) Operators:
<http://wis.wmo.int/file=687>
- Competencies for Marine Meteorological Personnel:
http://www.jcomm.info/index.php?option=com_content&view=article&id=307&Itemid=100038
- Competencies for Climate Services Personnel:
http://www.wmo.int/pages/prog/dra/etrp/documents/Climate_services_competencies_draft_05_14.pdf

3.1.2 Of the above competency frameworks, it was suggested that the WIS competencies may comprise the best model to use for the development of observing competencies because it was one of the most recent WMO competency frameworks developed, so had capitalized on previous WMO

competency framework development experience, and because WIS is closely related to WIGOS, in the sense that it is primarily a systems area as opposed to a services provision area.

3.2 WMO CIMO Instrument Calibration Competency Framework

3.2.1 Mr. Merrouchi provided the session with a brief presentation on the draft instrument calibration competency framework for laboratory staff that had recently been developed by the CIMO Expert Team on Regional Instrument Centres, Calibration and Traceability (ET-RIC). He noted that ET-RIC had taken the approach of defining these competencies for each type of staff member employed in a RIC (from the laboratory manager, to those performing the instrument calibrations). Detailed discussion of the draft framework was deferred until later in the session.

3.3 Status of Existing National Competency Frameworks

3.3.1 Each participant then provided a brief presentation to the session on the status of development of competency frameworks within their own organization. It became clear that while each country had significant observing infrastructure and programmes, the status of competency development in the observations area varied greatly.

3.3.2 Mr Shandu noted that the South African Weather Service (SAWS) had developed competencies for aviation observations staff in response to ICAO needs, but that more general observing competencies had not yet been developed. He described the typical duties that meteorological observers in SAWS are required to perform, including first-in maintenance of equipment, site cleaning, etc. and described some of the challenges SAWS faces, particularly in regard its technician staff and to standardization of procedures for radar operation and maintenance.

3.3.3 Mr Chan described the advanced state of development of observing competencies for aviation at the Hong Kong Observatory and the follow-on task of specifying assessment requirements.

3.3.4 Mr Harper noted that in New Zealand, the MetService employed very few observing staff today, since these roles were outsourced in the 1990s. He noted, however, that climate observers were still employed at some locations and there was a need for the development of competencies for the technicians responsible for observing infrastructure. Mr Harper also noted a strong need for development of observer competencies for many of the Pacific Island nations.

3.3.5 Mr Chen described the situation in China where many observing staff are employed and the observing system has grown enormously over the last few decades, with a concomitant need for the development of competencies for the staff involved.

3.3.6 Mr Atilan described a similar situation in Turkey, where a competency framework for observing staff is yet to be developed but for which the requirement is strong.

3.3.7 Finally, Dr Bell briefly described the competency frameworks that had been developed over the last decade or so by the Bureau of Meteorology in Australia for both observing staff and technicians and how competencies of all observing system staff are now regularly assessed, and training curricula are based upon the competency requirements, to maximize both the efficiency of resource expenditure and the effectiveness of service delivery.

4. CIMO REQUIREMENTS FOR COMPETENCIES

4.1 Overall CIMO Competency Requirements

4.1.1 The invited presentations by the participants were followed by a discussion on the overall requirements for competency framework(s) within the instrumentation and observations area of a NMHS. It was agreed that within CIMO's coverage, separate competency frameworks were likely to be required for more than just the weather observing function.

4.1.2 After a short brainstorming session, the team concluded that it would need to develop at least four separate sets of competencies:

- A Competency Framework for Meteorological Observations
- A Competency Framework for Instrumentation
- A Competency Framework for Instrument Calibration
- A Competency Framework for Observing Network and Programme Management

4.2 Detailed Competencies for Instrument Calibration

4.2.1 In view of the development by ET-RIC of draft competencies for instrument calibration staff, the session decided to commence with close consideration of the draft framework presented earlier by Mr Merrouchi, in the expectation that this would benefit later consideration of observer competencies.

4.2.2 Numerous comments were provided to Mr Merrouchi regarding the draft document. The session agreed that all the information required was there in terms of the Performance Components for each High Level Competency (HLC) and it congratulated Mr Merrouchi and ET-RIC on the completeness of the draft. However, it noted that the structure of the HLCs, which were divided into job levels rather than separate functions, did not fit well with the model adopted for the WIS competencies and the other WMO frameworks. It was agreed that Mr Merrouchi would work off-line with Dr Rüedi to reshape the structure for the framework to match more closely with the other WMO competency frameworks. The resulting revised list of HLCs for Instrument Calibration Staff is provided at [Annex II](#). It was considered that the subsequent task of filling in the details, based on the information in the first draft, would then be a relatively simple task, since all the required information was already to be found in the first draft of the framework. Dr Rüedi and Mr Merrouchi agreed to complete this subsequent task off-line after the session.

4.3 High Level Competencies (HLCs) for Meteorological Observations

4.3.1 Dr Bell provided the session with a first draft list of HLCs for meteorological observations. The session then refined the list, as a basis for development of a competency framework for meteorological observations. The agreed HLCs for Meteorological Observations were:

- Monitor the meteorological situation;
- Perform a surface observation;
- Perform an upper air observation;
- Monitor the performance of instruments and systems;
- Maintain the quality of observational information; and
- Maintain a safe work environment.

4.4 Detailed Competencies for Meteorological Observations

4.4.1 Using the competence framework template provided by Mr Patrick Parrish of WMO's Education and Training Department, the team then proceeded to derive detailed competencies (HLC description, performance components, knowledge and skill requirements) for each of the HLCs for Meteorological Observations. The resulting draft competency framework is at [Annex III](#).

4.5 Competencies for Instrumentation and for Observing Network and Programme Management

4.5.1 Completion of the draft competency framework for observing staff achieved the main aim of the session. With time still remaining, Dr Bell suggested two options for using the remainder of the

time available efficiently: derivation of HLCs for the remaining two competency sets, Instrumentation and Observing Programme and Network Management, or development of Training and Learning Guides for the Observing and Calibration competencies.

4.5.2 Dr Bell then advised that, from a WMO Education and Training Programme perspective, since the competencies the Task Team had developed for Observing and Calibration had been worded well to reflect the assessment requirements, there was little added value to be had in developing detailed Training and Learning Guides, and the participants could best use the remaining part of the session by commencing consideration of the remaining competency sets: competency requirements for observing programme and network management, and for installation, maintenance and repair of observing system equipment. The session divided itself into two breakout groups for this purpose, one for each framework. Each group commenced by listing the required HLCs, then as time permitted began to develop the detailed requirements under each HLC. The resulting draft competency frameworks are at [Annex IV](#) and [Annex V](#).

5. SUMMARY AND CONCLUSIONS

5.1.1 Having concluded the competency development work of the session, the participants updated the Task Team's Work Plan, which is included at [Annex VI](#).

5.1.2 In summarizing the achievements of the session, Dr Bell noted that the competencies developed by the session are very generic and that training institutions will need to tailor them to their situation and make them more specific depending on the focus of their observing programmes and training, for example, taking into account the types of instrumentation used in their particular networks.

6. DRAFT REPORT OF THE SESSION

6.1 The session agreed to finalize the report of the session by correspondence over the coming weeks.

7. CLOSURE OF THE SESSION

7.1 The session closed on Thursday 13 November 2014 at 16:00 hours.

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DRAFT HIGH LEVEL COMPETENCIES FOR INSTRUMENT CALIBRATION

1. Calibrate instruments.
2. Manage the laboratory work programme .
3. Manage the laboratory infrastructure (including traceability of standards).
4. Develop and maintain standard operating procedures (including calculation of uncertainty, and other software).
5. Manage the data archival.
6. Maintain the laboratory security and staff safety and health.

DRAFT COMPETENCY FRAMEWORK FOR METEOROLOGICAL OBSERVATIONS

Meteorological Observations: High Level Competencies

1. Monitor the meteorological situation
2. Perform a surface observation
3. Perform an upper air observation
4. Monitor the performance of instruments and systems
5. Maintain the quality of observational information
6. Maintain a safe work environment

Competency 1: Monitor the meteorological situation

Competency description

Appraise meteorological conditions to identify the significant and evolving situation that is affecting or will likely affect the area of responsibility throughout the watch period.

Performance components

1. Analyse the evolving local meteorological situation.
2. Use the evolving meteorological conditions to assist subsequent observations.
3. Identify the likely onset of significant weather and alert prescribed recipients.

Knowledge and skill requirements

- Basic meteorological understanding
- The synoptic situation and forecast
- Cloud and weather identification and evolution
- Meteorological factors leading to the evolution of significant weather
- Standard operating procedures, practices and quality management systems

Competency 2: Perform a surface observation

Competency description

Perform surface observations of meteorological variables and phenomena, and their significant changes, according to prescribed practices.

Performance components

1. Observe and record:

- precipitation
- atmospheric pressure
- temperature
- humidity
- wind
- cloud
- present and past weather
- visibility
- radiation
- sunshine duration
- evaporation
- soil temperature
- state of the ground
- other specialised observations as required (e.g., soil moisture, sea state, atmospheric composition, wind shear, leaf wetness, phenology)

2 Encode and transmit surface observations using prescribed codes and methods

Knowledge and skill requirements

- Basic meteorological understanding
- Cloud and weather identification
- Standard operating procedures, practices and quality management systems
- Accuracy requirements
- Onsite instrumentation and systems (including software)
- Care in handling and accuracy in reading instruments
- Meteorological Codes

Competency 3: Perform an Upper Air Observation

Competency description

Perform an upper air observation, according to prescribed practices and procedures.

Performance components

1. Prepare and deploy balloons and their payloads:
 - Balloon shed safety check
 - Balloon preparation and filling
 - Instrument ground check
 - Balloon release
2. Track balloon flight
3. Compute and record:
 - upper air pressure, temperature and humidity,
 - upper air wind speed and direction,
 - other specialised upper air observations as required (e.g., ozone)
4. Encode and transmit upper air observations using prescribed codes and methods

Knowledge and skill requirements

- Hydrogen safety and generation
- Basic meteorological understanding
- Standard operating procedures, practices and quality management systems
- Accuracy requirements
- Onsite instrumentation and systems (including software)
- Care in handling and accuracy in reading instruments
- Meteorological Codes

Competency 4: Monitor the performance of instruments and systems

Competency description

Monitor the status and performance of observational instrumentation and communications systems.

Performance components

1. Regularly inspect meteorological instruments (e.g., raingauge, wet bulb), automated observing systems (e.g. AWS, weather radar fault status), communications systems and backup systems (e.g., power).
2. Conduct routine maintenance tasks as prescribed (e.g. change wet bulb wick, change recorder charts, clean pyranometer dome, or ceilometer window)
3. Conduct first-in fault diagnosis and alert responsible staff.
4. Undertake action under guidance from remote technical staff.
5. Record interventions and irregularities in a maintenance log / metadata repository

Knowledge and skill requirements

- Standard operating procedures, practices and quality management systems
- Accuracy requirements
- Onsite instrumentation and systems (including software)
- Care in handling and accuracy in reading instruments
- Meteorological codes
- Hazard awareness
- Contingency plans

Competency 5: Maintain the quality of observational information

Competency description

The quality of meteorological observations is maintained at the required level by the application of documented quality management processes.

Performance components

1. Monitor all observations to check for errors and inconsistencies, correct errors or flag data in accordance with prescribed procedures and take follow-up action.
2. Record corrections, flags and follow-up actions in metadata repository.
3. Check observational messages for format and content before issuance and make corrections if required.
4. Ensure all observations are successfully sent and received.

Knowledge and skill requirements

- Basic meteorological understanding
- Standard operating procedures, practices and quality management systems

- Accuracy requirements
- Onsite instrumentation and systems (including software)
- Meteorological Codes
- Contingency plans

Competency 6: Maintain a safe work environment

Competency description

Perform all observing tasks in a safe and healthy working environment, at all times complying with occupational health and safety regulations and procedures.

Performance components

1. Safely handle, store and dispose of hydrogen and the chemicals used for generating hydrogen.
2. Safely handle, store and dispose of mercury, and equipment containing mercury.
3. Safely handle, store and dispose of other toxic or dangerous substances, and equipment containing these substances (such as wet cell batteries).
4. Perform safely in the proximity of electrical hazards.
5. Safely perform all observing tasks while minimizing exposure to hazardous environmental conditions (severe weather, lightning, flood, hurricane, fires, etc.)
6. Safely perform all observing tasks in the presence of safety hazards (working at heights, in the proximity of microwave radiation, compressed gases, etc.)
7. Maintain a register of hazards and hazard management

Knowledge and skill requirements

- Hydrogen safety procedures
 - Mercury safety procedures
 - Chemical safety procedures
 - Electrical safety procedures
 - Occupational Health and Safety requirements
 - Hazard identification and mitigation
 - Hazard register
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DRAFT COMPETENCY FRAMEWORK FOR OBSERVING PROGRAMME AND NETWORK MANAGEMENT (INCOMPLETE)

Observations Programme and Network Management: High Level Competencies

1. Planning
2. Procurement
3. Installation
4. Network Management

Competency 1: Planning

Competency description

TBA

Performance components

1. Carry out a need analysis (strategic and operation planning)
2. Keep abreast of technology development
3. Carry out life cycle planning of observation infrastructure
4. Identify the relevant infrastructure (other equipment and communication)
5. Design network topology/structure (site location selection)
6. Human resource planning

Knowledge and Skill Requirements

TBA

Competency 2: Procurement

Competency description

TBA

Performance components

1. Conduct engineering design and define equipment specifications (what to buy)
2. Initiate tender process (Identifying and selection of suppliers)

3. Acceptance tests (Factory and site acceptance)

Knowledge and Skill Requirements

TBA

Competency 3: Installation

Competency description

TBA

Performance components

1. Site survey and selection (put a stick in the ground)

Knowledge and Skill Requirements

TBA

Competency 4: Network Management

Competency description

TBA

Performance components

1. Maintenance schedules
2. Life Cycle planning
3. Coordination
4. Human resource management

Knowledge and Skill Requirements

- Knowledge of instruments and performances
- Procurement regulation
- Project management and financial planning skill

DRAFT COMPETENCY FRAMEWORK FOR INSTRUMENTATION (INCOMPLETE)

Instrumentation: High Level Competencies

1. Install instruments and communications
2. Maintain Instrumentation and Systems
3. Diagnose faults
4. Repair Instrumentation and Systems
5. Maintain a safe working environment

Notes:

- The need to include consideration of metadata
- Include all observational equipment (site works plus instruments plus communications plus other ancillaries (power, access, etcetera))
- Network planning and procurement has been completed before this point. In the case of large or high cost equipment/systems (e.g. satellite receiver, weather radar, radar wind profiler), installation has also been included as part of procurement.
- Assume that all instrumentation is sourced from 'stores' calibrated and in good working order.
- The start point is with an instrument delivered to site.

Competency 1: Install instruments and communications (include site acceptance testing)

Competency description

TBA

Performance components

1. Assess siting conditions (exposure assessment)
2. Select the right instruments
3. Assemble and test instruments before site installation
4. Install instruments at the site following prescribed procedures and guidance

Knowledge and Skill Requirements

TBA

Competency 2: Maintain Instrumentation and Systems

Competency description

TBA

Performance components

1. Plan and schedule instrument preventive maintenance programme
2. Schedule corrective maintenance
3. Monitor the performances of instruments and systems (data availability)
4. Maintain the instruments and systems in normal operation
5. Carry out preventive maintenance following prescribed procedures (sophisticated equipment like radar, lightning detection equipment, AWS, changing bearing of wind sensors)
6. Verify the performance of instruments at the site using travelling standards (Calibration checks) and make correction or replace instruments by calibrated ones

Knowledge and Skill Requirements

TBA

Competency 3: Diagnose Faults

Competency description

TBA

Performance components

1. Detect abnormality
- 2.
- 3.

.....

Knowledge and Skill Requirements

TBA

Competency 4: Repair Instrumentation and Systems

Competency description

TBA

Performance components

1. Carry out corrective maintenance of instruments and systems following prescribed procedures
- 2.

Knowledge and Skill Requirements

TBA

Competency 5: Maintain a safe work environment

Competency description

TBA

Performance components

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Knowledge and Skill Requirements

- a) Instrument performance specifications (understand the performances of various instruments)
- b) Maintenance planning and scheduling (mobile staff resources to carry out maintenance)
- c) Verification of weather observing instruments and peripheral equipment
- d) Operation of communication hardware (modems) and software

Work Plan: Task Team on Competencies*(updated 13 November 2014)*

No.	Task description	Person responsible	Action	Deliverable	Deadline for delivery	Status [%]	Comments
1.	Competency sets required for observations and instrumentation	Shandu All	<ol style="list-style-type: none"> Review existing relevant material and examples (e.g. competencies developed by other TCs and work done by former ET-RIC) Liaise with EC Panel of Experts on Education and Training to follow WMO overall approach to this topic. Derive overall competency sets required to cover all functions related to instrumentation and observations 	<ol style="list-style-type: none"> Documentation List List of competency sets. 	<ol style="list-style-type: none"> 10 Nov 2014 13 Nov 2014 	<ol style="list-style-type: none"> 100 % 100 % 	CIMO-XV, para 6.20 CIMO-16 6.19, 7(6).3
2.	Competencies for meteorological observations.	Shandu All	<ol style="list-style-type: none"> Develop competencies for meteorological observations. 	<ol style="list-style-type: none"> Document with required competencies for consideration of CIMO MG. 	<ol style="list-style-type: none"> 26 Nov 2014 	90%	
3	Competencies for instrumentation	<ol style="list-style-type: none"> Shandu Chen Chan Angulu Harper Atilan 	<ol style="list-style-type: none"> Develop draft competencies for observational instrumentation. <ol style="list-style-type: none"> HLCs 1,5 HLCs 3,4 HLCs 2 Finalise 	<ol style="list-style-type: none"> Document with required competencies for consideration of CIMO MG. 	<ol style="list-style-type: none"> Teleconf Feb 2015 	30%	
4	Competencies for instrument calibration	Harper All	<ol style="list-style-type: none"> Review and revise draft competencies for instrument calibration developed by ET-RIC. Finalise 	<ol style="list-style-type: none"> Document with required competencies for consideration of CIMO MG. 	<ol style="list-style-type: none"> Teleconf Feb 2015 	70%	

No.	Task description	Person responsible	Action	Deliverable	Deadline for delivery	Status [%]	Comments
5	Competencies for observing network and programme management	a. Chen Shandu b. Angulu Chan c. Atilan Harper	Develop draft competencies for meteorological observations. a Network Management b Planning c Procurement and Installation	Document with required competencies for consideration of CIMO MG.	2. Teleconf Sep 2015	5%	
6	WMO Regulatory and/or Guidance Material	Shandu All	1. Recommend to CIMO MG on where output should appear. 2. Arrange for inclusion of competencies in CIMO Guide and/or WMO regulatory documentation	3. Recommendation to CIMO MG on regulatory status of competencies. 4. Update of relevant CIMO Guide chapter or regulatory material	1. Dec 2015	0%	