W O R L D M E T E O R O L O G I C A L O R G A N I Z A T I O N

COMMISSION FOR INSTRUMENTS AND METHODS OF OBSERVATION

CIMO MANAGEMENT GROUP

Thirteenth Session

Offenbach, Germany

7 – 9 December 2014

FINAL REPORT

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EXECUTIVE SUMMARY

The Thirteenth session of the CIMO Management Group (CIMO MG-13) was held from 7 to 9 December 2014, in Offenbach, Germany.

The meeting reviewed the workplans of all CIMO Expert Teams, Task Teams and Theme Leaders to ensure they were in line with CIMO priorities and that they had clear deliverables that would be supporting WMO high priority activities.

The meeting also addressed a number of topics related to the planning, coordination and management of CIMO activities. These included among others the composition of CIMO Expert Teams, the planning of CIMO activities, the CIMO working and reporting mechanism, and collaboration with the International Organization for Standardization and with the Association of Hydro-Meteorological Equipment Industry.

The meeting also reviewed a scheme for awarding certificates to CIMO Experts for significant contributions to CIMO and reviewed the guidelines for granting the Prof. Vilho Väisälä Awards.

The meeting was informed on the preparations for the Seventeenth World Meteorological Congress in 2015.

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GENERAL SUMMARY

1. ORGANIZATION OF THE SESSION

1.1 Opening of the Session

1.1.1 The thirteenth session of the Commission for Instruments and Methods of Observation (CIMO) Management Group (MG-13) was held at DWD Headquarters in Offenbach, Germany at the kind invitation of the Permanent Representative of Germany with WMO. The session was opened on Sunday, 7 December 2014 at 9:00, by the president of CIMO, Prof. Bertrand Calpini. He welcomed all the participants to the meeting. The list of participants is given in Annex I.

1.1.2 The Director of the WMO Observing and Information Systems Department, Dr Wenjian Zhang, welcomed the participants on behalf of WMO. He stressed the importance of the coming session to agree on and prioritize all tasks to be carried out by the CIMO expert teams during the next 4 years of the inter-sessional period.

1.2 Adoption of the Agenda

The meeting adopted the Agenda as reproduced at the beginning of this report.

1.3 Working Arrangements for the Session

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

2. REPORT OF THE PRESIDENT

2.1.1 The president reported on some key aspects relevant to the work of CIMO, and his activities as CIMO president since CIMO-16, as well as on the work that CIMO is expected to carry out during the intersessional period.

2.1.2 He appreciated that this meeting was taking place shortly after the CIMO-16 session and was already able to review the workplans of the CIMO expert teams (ETs), task teams (TTs) and theme leaders (TLs). He recognized that this pace of work was giving real momentum to the commission work and thanked all the CIMO MG members for that engagement.

2.1.3 The president noted that the use of new communication technologies for meetings has totally changed the work of the commission. Over the last 2-3 years, there has been a strong increase in teleconferences of ETs which has had a real impact on the work. He noted and greatly appreciated that all teams had already had a teleconference since CIMO-16. He encouraged all teams of the commission to continue having regular teleconferences to progress the work.

2.1.4 The president mentioned the outcomes of the CIMO/WIGOS Exploratory Workshop: Improving Surface-based Data Quality through Improved Standardization of Procedures, that was held in Offenbach, Germany from 3 to 5 December 2014. Various aspects of the traceability of both in-situ and remote-sensing technologies were considered. The workshop recommended, among others, strengthening Regional Instrument Centres (RICs) and supporting them in achieving ISO 17025 accreditation, and also identified the need to establish an international coordination mechanism for weather radar systems and their data and products, noting their potential use for climate applications.

2.1.5 The president had attended an ISO meeting in Pretoria, South Africa. Further information on this topic is provided in Section 4.4 of this report.

2.1.6 The president had also attended the Extraordinary Session of the Commission for Basic Systems in Asuncion, Paraguay, which had focused mainly on WIGOS.

3. REVIEW AND APPROVAL OF CIMO WORK PROGRAMMES

The meeting noted that some CIMO ETs had prioritized their activities. The meeting stressed that all the mentioned activities should be accomplished during the inter-sessional period and that a high priority assigned to a task meant that it must be completed before the CIMO-17 session, while a lower priority signaled the need for completion if at all practicable before the CIMO-17 session.

3.1 OPAG In-Situ Technologies and Instrument Intercomparisons

Expert Team on Operational In-Situ Technologies (ET-OIST)

3.1.1 The meeting reviewed the workplan of the ET-OIST and approved the plan as provided in Annex II. The meeting noted that the workplan was challenging and that the team had set some rather tight deadlines. It appreciated the commitment of the team to deliver the high-priority tasks rapidly and acknowledged that some of the other deadlines might require adjustment later.

3.1.2 The meeting recognized that Task 2 (Guidelines on migration from manual to automated observations) must include specific guidance on the transition to automation as well as on the introduction of replacement technologies. It should also include a discussion on the advantages and disadvantages of moving to automation, provide information on best practice procedures for introducing automatic systems as well as on training needs for staff responsible for their maintenance. The meeting recommended that the sub-group of experts listed for this task address the task as a team, each contributing a significant part of the document, and that the team starts its work by organizing a teleconference which includes the OPAG Chairperson to clarify the structure and expected content of the document.

3.1.3 The meeting noted that a number of Members are presently implementing the siting classification for surface observing stations on land and that it had been very helpful in improving networks, but it also noted that some Members had faced challenges to implement it. The meeting appreciated the plan to document the experiences of different Members and the way they managed to overcome difficulties in implementing it. The meeting was pleased to learn that the EURAMET Meteomet2 project would involve an activity to assess and verify the uncertainty linked to each class of site.

Expert Team on Developments in In-Situ Technologies (ET_DIST)

3.1.4 The meeting reviewed the workplan of the ET-DIST and approved the plan as provided in Annex III.

3.1.5 The meeting recognized that the team may not have the requisite experience to cover all fields. In such cases, the team would have to liaise with other CIMO ETs/experts to obtain the information.

3.1.6 The meeting recognized that, before CIMO could provide WMO Members with appropriate guidance on best practice for the measurement of icing, it was the responsibility of NMHSs to provide information on the requirements for these measurements through the WMO Rolling Review of Requirements, in particular because of their relevance to the energy (icing on power lines) and transport communities. Therefore, the meeting decided not to include this topic in the ET workplan at this stage.

3.1.7 Dr Ondras, from the WMO Secretariat, offered to identify some experts from the University of Wisconsin to contribute to the tasks relevant to polar observations, so that the team could assist the Global Cryosphere Watch (GCW) in defining best practices for snow measurements and identification of systems (with low power consumption) suitable for polar regions.

3.1.8 The meeting welcomed the interest expressed by the ET to work on the development of guidance related to low cost, in-situ observing equipment and agreed to the inclusion of

such a task in the ET workplan. The meeting noted that low cost AWSs will, in most cases, not be able meet all the requirements of NMHSs and that instruments have to match the purpose for which they are used/purchased. It also noted that the initial instrument purchase costs are usually small (typically 25%) in comparison with their overall lifetime costs. The meeting agreed that Members would benefit from guidance on what low cost systems (AWS, for example) can achieve and what they cannot achieve. [The meeting noted that there had been demand expressed for similar guidance on low-cost remote-sensing systems such as X band weather radars and that this is included in the work plan of ET-ORS.]

Expert Team on Instrument Intercomparisons (ET-II)

3.1.9 The meeting reviewed the workplan of the ET-II and approved the plan as provided in Annex IV.

3.1.10 The meeting considered the proposal from ET-II to establish two Task Teams (TT) to carry out the intercomparison feasibility studies. The meeting agreed to establish a Task Team on Upper-air In-Situ and Remote-sensing Measurements Intercomparison and to invite the following experts to be members of the TT:

- Rolf Philipona (Switzerland) - Chairman
- Masatomo Fujiwara (Japan)
- Tim Oakley (United Kingdom)
- Holger Vömel (USA)
- Alexander Häfele (Switzerland).

Furthermore, the meeting recommended that the TT liaise with the CIMO Expert Team on Aircraft-based Observations towards possibly including aircraft observations in the proposed intercomparison.

3.1.11 The meeting appreciated the proposal of ET-II to conduct a 3-day workshop in April/May 2015 to develop ideas and to make strategic choices towards an Aerosols and Volcanic-Ash Intercomparison which could then be consolidated by the Task Team Aerosols and Volcanic-Ash Intercomparison to complete the feasibility study. However, the meeting indicated that no funds were presently available to support such a workshop and consequently participants would either have to fund themselves or the workshop would have to be organized by teleconference.

3.1.12 The meeting recommended that the composition of the Task Team Aerosols and Volcanic-Ash Intercomparison be refined and re-submitted for approval to the CIMO MG in Q2 2015 after the initial e-mail brainstorming of interested parties, when the commitment of interested experts to contribute to the drafting of the feasibility study would have been clarified.

Expert Team on Aircraft-based Observations (ET-AO)

3.1.13 The meeting noted that the presentation of the workplan of the ET-AO differed from the others. The reason for this difference is to have consistency in format with the workplan of the CBS Expert Team on Aircraft-based Observing Systems and to follow-up on the practices that were in use by the AMDAR Panel from which both of these expert teams have been created.

3.1.14 The meeting reviewed the workplan of the ET_AO and approved the plan as provided in Annex V.

Task Team on Radiation References (TT-RadRef)

3.1.15 The meeting was informed that the Swiss National Science Foundation had agreed to support a project that would investigate the possible offset of the radiation references presently in use (World Radiometric Reference, and World Infrared Standard Group) and

their impact to the user community, including the Baseline Surface Radiation Network (BSRN) archive. The outcomes of this project will be a major contribution to the Task Team on Radiation References, which will be able to build on these results. The meeting was also informed that a BSRN representative was involved in this project, which ensures an appropriate link with the BSRN user community.

3.1.16 The meeting stressed the importance of organizing International Pyrheliometer Comparisons (IPCs) at regular intervals (every 5 years) as WMO is presently maintaining the World Radiometric Reference (WRR) for the world community. The meeting appreciated the outstanding contribution made by Switzerland in supporting PMOD/WRC that is maintaining the WRR for WMO. The meeting noted that laboratories that are accredited according to ISO 17025 have to demonstrate their traceability to the WRR by attending these intercomparisons and therefore requested that IPC-XII be organized in 2015.

3.1.17 The meeting requested the TT-RadRef to ascertain the importance of the WRR for the user community and in particular with the satellite community which needs this information for ground-based validation of satellite observations. The meeting also requested the Task Team to examine the effectiveness of the inter-comparisons at IPCs to support and sustain the global traceability hierarchy of the WRR and WISG, and to advise WMO if it should still be accountable for these references and if not, to recommend options.

3.1.18 The meeting was pleased that representatives of the BIPM and EURAMET were willing to participate in the work of the Task Team.

3.1.19 The meeting reviewed the workplan of the TT-RadRef and approved the plan as provided in Annex VI.

3.2 OPAG Remote Sensing Technologies

Expert Team on Operational Remote-Sensing Technologies (ET-ORS)

3.2.1 The meeting was informed that China is planning to propose a CIMO Testbed on verification of lightning detection systems. The meeting welcomed this proposal and encouraged China to proceed with its proposal.

3.2.2 The meeting reviewed the workplan of the ET-ORS and approved the plan as provided in Annex VII.

3.2.3 The meeting was reminded of the discussion under item 3.1 regarding the demand expressed by WMO Members during CIMO-16 for guidance on low-cost remote-sensing systems such as X band weather radars. The meeting noted the inclusion of such a task in the work plan of ET-ORS.

Expert Team on New Remote-Sensing Technologies (ET-NRT)

3.2.4 The meeting reviewed the workplan of the ET-NRT and approved the plan as provided in Annex VIII.

Theme Leaders on Radio-frequency Protection (TL-RFP)

3.2.5 The meeting noted that the CIMO Guide already included some information on the protection of radars from interference caused by wind-farms. However, some Members have requested that more precise, possibly binding, guidance is developed to better help them protect their weather radars from such interference.

3.2.6 The meeting was informed that some Members had made very positive experiences in suppressing the interference to dual polarization radar operations caused by wind turbines. The meeting was also informed that EUMETNET OPERA has an on-going project precisely addressing this issue.

3.2.7 The meeting reviewed the workplan of the TL-RFP and approved the plan as provided in Annex IX.

3.3 OPAG Capacity Development and Operational Metrology

Expert Team on Operational Metrology (ET-OpMet)

3.3.1 The meeting was informed that a major revision of the Guide for Uncertainty in Measurements (GUM) is underway and may take a very different approach than has been the case up until now, with potential implications for CIMO's work. The meeting appreciated the offer of Jitze van der Meulen to regularly update the CIMO MG on this matter.

3.3.2 The meeting was informed that a major difficulty in organizing Regional Instrument Centre (RIC) interlaboratory comparison was the lack of intercomparison kits. The meeting recommended seeking options to make such kits available, so that they could be circulated to RICs. The meeting encouraged the MG members to liaise with their NMHSs and consider whether they could make one or more such kits available to WMO/CIMO to conduct RIC interlaboratory comparisons. Furthermore, the meeting encouraged the African-China collaboration to provide such kits to RICs in Africa.

3.3.3 The meeting was informed that Netherlands and France had done some work on the calibration of visibility meters and that ICAO was requesting that they be calibrated according to a standard. The meeting recommended that the ET takes this information into account while developing guidance material on the calibration of visibility meters and ceilometers.

3.3.4 The meeting recognized that the guidance on how to adapt to the effects of the Minamata Convention on Mercury by transitioning away from mercury would have to be general as Members may decide to implement it in different ways depending on their own constraints.

3.3.5 The meeting reviewed the workplan of the ET-OpMet and approved the plan as provided in Annex X.

CIMO Editorial Board

3.3.6 The meeting reviewed the workplan of the CIMO Editorial Board and approved the plan as provided in Annex XI.

3.3.7 The meeting was pleased to learn that the French, Russian and Spanish version of the CIMO Guide (2008 Edition, updated in 2010) were about to be released. The meeting noted that the CIMO Guide had been significantly updated in 2014 and that it would be important to ensure that the 2014 version would also be translated in other official WMO languages. The meeting recommended that WMO Members be encouraged to contribute to this process as they did for the 2008 Edition, updated in 2010.

3.3.8 The meeting noted that the 2014 Edition of the CIMO Guide was available on the WMO website, but that it still included track-changes approved by CIMO-16. Some experts have indicated being confused by these track-changes, as well as by the watermark included on those documents. The meeting recommended that the Secretariat clarifies the text describing the version of the CIMO Guide on the website, and that it removes the track-changes and modifies the watermark from the latest version to avoid confusion.

Theme Leader on Radiosonde Monitoring

3.3.9 The meeting reviewed the workplan of the Theme Leader on Radiosonde Monitoring and approved the plan as provided in Annex XII.

Task Team on the International Cloud Atlas (TT-ICA)

3.3.10 The meeting was informed about the progress already made by the TT-ICA which met from 6 to 9 October 2014 in Geneva. Most of the images of the ICA will have to be

replaced to benefit from the increased image quality achievable with present-day technologies. Hong Kong kindly agreed to host a temporary web-site for image-sourcing.

3.3.11 The meeting appreciated that the Task Team was working towards having some concrete outcomes available by the time of Cg-17 and that a side-event on this topic had been planned to take place during Cg-17.

3.3.12 The meeting recommended that the CIMO president and the director of the WMO Observing and Information Systems Department have discussion during the Seventeenth WMO Congress (Cg-17) with Permanent Representatives whose organizations could possibly host the ICA website. It also recognized that this would require a long term commitment from the website-host to maintain the website over the years.

3.3.13 The meeting recognized that the website would have to be of high quality and have been fully tested before it could be made openly accessible.

3.3.14 The meeting recommended that a review of the outcomes be performed immediately prior to construction of the website as the later steps will depend on the technology used for the website, which itself will depend on the entity hosting it.

3.3.15 The meeting reviewed the workplan of the TT-ICA and approved the plan as provided in Annex XIII and congratulated the team for the excellent progress made to date.

Task Team on Competencies (TT-Comp)

3.3.16 The meeting appreciated that the Task Team met in Casablanca from 10 to 13 November 2014 and had already made significant progress in its work. It noted that the target deadlines were very tight and that the outcome of the TT-Comp work would have to be reviewed by the WMO Education and Training Programme before finalizing publication of the competencies in appropriate WMO regulatory or guidance documents. The meeting reviewed the workplan of the TT-Comp and approved the plan as provided in Annex XIV.

4. ISSUES RELATED TO PLANNING, COORDINATION AND MANAGEMENT OF COMMISSION ACTIVITIES

4.1 Expert Teams Membership and other CIMO Representatives

4.1.1 The meeting reviewed the list of experts nominated for the CIMO expert teams (ETs), task teams and theme leaders that was approved by the CIMO Management Group by correspondence and that is reproduced in the Annex XV. This list also includes the Focal Points of CIMO Testbeds and Lead Centres as assigned by CIMO MG-12 to specific CIMO ETs.

4.1.2 The meeting was pleased that the Association of Hydro-Meteorological Equipment Industry (HMEI) and the International Bureau on Weights and Measures (BIPM) had proposed a number of experts to represent them in the work of the CIMO ETs.

4.1.3 The meeting nominated, or noted that the CIMO president had nominated, the following persons to represent CIMO in relevant activities:

- **Task Team on the WIGOS Metadata:** Ercan Büyükbas
- **BIPM/CCT Task Group on Environment:** Drago Groselj.

4.2 The meeting was also informed that the CIMO president had been nominated as WMO representative on the European Association of National Metrology Institutes (EURAMET) Research Council.

4.3 The meeting was informed that CIMO had been invited to participate in a meeting of an Intercommission Task Team on Land Transport that would be held on 28 January 2015. The meeting recommended that the CIMO president be present at this meeting to assess how CIMO could support such an initiative.

4.4 Planning of CIMO Activities

4.4.1 The meeting was informed about the tentative plan to hold CIMO activities in the period 2014-18 provided in the Annex XVI. It was noted that changes could occur in particular due to budgetary reasons, availability of Secretariat support, availability of Members to host specific events, progress of ET work, and availability of ET chairpersons and members.

4.4.2 The meeting recommended considering linking the organization of TECO-2016 and of the CIMO Management Group meeting. It also agreed that a three-day TECO is very intense and that it could be envisaged to extend its duration to 4 days to allow participants to spend more time in the exhibition, but recommended not to organize parallel sessions The exit survey of TECO-2014 praised the 1-minute poster presentation, which should be repeated for future TECOs.

4.4.3 Mario Garcia informed the meeting that Argentina is offering to host a training workshop on calibration at its RIC of Buenos Aires at the end of 2015. The meeting welcomed this offer, especially as the RIC of Buenos Aires had been modernized recently and was in the process of undergoing ISO 17025 accreditation.

4.4.4 The meeting appreciated that the WIGOS project office was taking the lead to organize Regional Workshops on Automatic Weather Stations, and recommended this should be done in close cooperation with CIMO.

4.4.5 The meeting recognized that it was expected that the participation in a workshop addressing observations at mountain stations would be mainly self-funded, or through use of funds provided for this purpose to the CIMO Trust Fund.

4.5 CIMO Working Mechanisms

4.5.1 The meeting recalled that the Annex to Resolution 1 (CIMO-16) clearly summarizes the working structure of the Commission. CIMO-16 provided additional guidance on the role of **the Co-Chairpersons of the Open Programme Area Groups** through its Resolution 2. CIMO-16 had also stressed in §9.9 "***the crucial role played by ET Chairpersons*** *in achieving the goals of the Commission by* ***coordinating and stimulating the work done by their respective ETs****. It also recalled that it is highly desirable to avoid changing ET Chairpersons during the intersessional period. The Commission encouraged the ET Chairpersons* ***to be in frequent contact with all experts of their ET to coordinate their work, ensure regular progress and provide them with guidance****, if needed. The Commission also encouraged ET Chairpersons* ***to closely liaise with the CIMO MG****, in particular with their relevant OPAG Chairperson,* ***and seek guidance from them*** *in case of need to ensure the ET outcomes meet Members expectations and requirements*".

4.5.2 The meeting agreed to maintain similar practices as in the past to monitor the work of the commission and adopted the following practices:

Reporting Mechanism for CIMO Expert Teams and Theme Leaders, and Coordination between ETs

- On a 6-monthly basis (end of March and end of September), the ET chairs should update the column "Status" and "Comments" of the ET workplan and send it to the responsible MG member with copy to the Secretariat. The column status should be filled with the percentage of achievement for each individual subtask.
- Prior to each session of the Management Group, the ET chairs will be requested to provide a more detailed report using a template similar to the template that was used for previous CIMO MG sessions.

- MG members are responsible to ensure they get the reports of the teams under their leadership in due time and to follow-up reviewing the ET outcomes, identifying points needing guidance or raising concern and they will keep the President and Secretariat informed on their assessment of the situation.

- Noting that the ET-II had a coordinating role with respect to instrument intercomparisons, CIMO MG-13 requested all the members of all CIMO ETs and TLs to inform the chair of ET-II in case they were aware of instrument intercomparisons being carried out, which could have results of relevance to CIMO. These could be, for example, intercomparisons carried out by individual Members as well as by group of Members or by other technical commissions.

- CIMO-MG-13 requested all the ETs and TLs to submit the relevant outcomes of their work as updates to the CIMO Guide Editorial Board following the agreed upon procedures.

Reporting Mechanism for CIMO Testbeds and Lead Centres

- According to their Terms of Reference, CIMO Testbeds and Lead Centre must provide at least one report every two years to the CIMO-MG. These reports will be requested for 31 March 2016 and 31 March 2018. These dates may be modified, depending on the timing of forthcoming CIMO MG meetings to ensure the reports will be available for consideration prior to these meetings.

4.6 Collaboration with ISO

4.6.1 Mr Simon Jaeckel, Secretary of the ISO Technical Committee 146 “Air Quality” / Sub-Committee 5 “Meteorology” (ISO TC146/SC5) informed the meeting about the present activities and future plans of ISO TC146/SC5 that are of relevance to CIMO and WMO Members in general. ISO TC146/SC5 is planning among others to develop standards on weather radars, and radar wind profilers, sodars and radiation instruments. The meeting was pleased to see that ISO TC146/SC5 was active and had a strong secretarial support. Mr Jaeckel also informed the meeting about the development process for ISO standards and welcomed collaboration with WMO.

4.6.2 The meeting was concerned by the fact that ISO/TC180 “Solar Energy” was apparently not active, while its standards addressing solar observations were obviously outdated and that some of those standards were now considered for update under ISO TC146/SC5.

4.6.3 Some MG members shared their personal experience of collaborating with different ISO TCs. They indicated that some ISO TCs are more active than others and that their level of response to comments from members/observers strongly varies. The meeting noted that ISO TC113 – Hydrometry is also relevant to the activities of CIMO.

4.6.4 The meeting encouraged CIMO experts, and NMHSs in general, to actively take part in ISO Technical Committees through their national channels. Should the meteorological community not take an active role in these committees, it runs the risks that some standards will account mainly for the interests of the private industry, which could strongly impact NMHSs if those standards are later made mandatory for specific activities.

4.6.5 The meeting noted that there are risks and benefits associated with the development of common WMO/ISO standards, and recommended that CIMO actively collaborates on activities of common interest to ISO and WMO to ensure that the interests of the meteorological community be appropriately taken into account in relevant standards.

4.6.6 The meeting recommended that as a matter of principle, WMO should actively engage in ISO activities that could have a strong impact on WMO Members. Therefore, the

meeting recommended that WMO approaches ISO towards updating the following standards from ISO TC180/SC1 as common WMO-ISO standards:

- ISO 9488: 1999 - Solar energy – Vocabulary
- ISO 9847: 1992 - Solar energy -- Calibration of field pyranometers by comparison to a reference pyranometer
- ISO 9059:1990 - Solar energy -- Calibration of field pyrheliometers by comparison to a reference pyrheliometer
- ISO 9060:1990 - Solar energy -- Specification and classification of instruments for measuring hemispherical solar and direct solar radiation
- ISO 9846:1993 - Solar energy -- Calibration of a pyranometer using a pyrheliometer.

It also recommended that WMO approaches ISO towards developing the following standards as common WMO-ISO standards, once ISO has formally decided to embark on them:

- ISO TC146/SC5 Standard on weather radars
- ISO TC146/SC5 Standard on radar wind profilers.

4.6.7 The meeting recommended that the above proposals be submitted to the WMO Executive Council for approval. It also recommended that the WMO Executive Council Resolution on the development of common ISO/WMO standard be reviewed and possibly updated in light of the above.

4.7 Collaboration with HMEI on Tender Specifications

4.7.1 The meeting was informed about the progress made by HMEI in developing guidance documentation and generic tender documentation/templates for the procurement of meteorological instruments. Roger Atkinson, as the WMO liaison person on the project team, has provided feedback to the project team on several occasions. Bruce Forgan has agreed to represent CIMO on the project advisory board.

4.7.2 The meeting was pleased that some progress had been made and recommended that once the HMEI project plan is more advanced it be circulated for review to interested CIMO Management Group members.

4.7.3 The meeting stressed that specifications are only one part of a procurement process and recognized that it might be necessary to develop additional guidance to Members, on the other aspects of a procurement process should these not be included in the HMEI project.

4.8 Reports of CIMO Focal Points and other CIMO Representatives

4.8.1 CIMO Focal Points were invited to brief the meeting on any emerging issue related to their focal activities and particularly those requiring active involvement of CIMO Expert Teams to support them.

4.8.2 Some discussion took place related to the task of the CIMO Focal Point for the Executive Council Panel of Experts on Polar Observations, Research and Services (EC-PORS). The meeting agreed that the main task of the focal point is to guide the commission to provide appropriate support to the requirements of EC-PORS. The meeting noted that EC-PORS would need support from CIMO among others on best observing / measurement practices, terminology, and in selecting the Cryonet stations.

5. CIMO CERTIFICATES AND AWARDS

Guidelines for granting the Prof. Vilho Väisälä

5.1 The meeting was invited to propose modifications to the guidelines for granting the Vaisala awards to consider other channels of submission, which could increase the number of submissions for the award, further encourage the submissions from developing countries, clarifying the linkage of the Award for the Development and Implementation of the Instruments and Methods of Observation (hereafter called 2nd award) to the developments carried out in developing countries, and refine the criteria for granting the awards to avoid possible misinterpretation of the criteria.

5.2 The meeting proposed that the 2nd award be granted for "building capacities in developing countries for WIGOS". The meeting also proposed that CIMO Expert Teams be allowed to submit proposals for the awards, not necessarily authored by their members.

5.3 The meeting requested the CIMO MG members to send their proposals to the president and Secretariat who will prepare a proposal for the consideration of the WMO Executive Council.

CIMO Certificates

5.4 The meeting was presented with a proposed scheme for granting CIMO certificates to experts who contributed significantly to the work of CIMO. The meeting agreed that CIMO should have 3 different levels of certificates tentatively called, in order of increasing significance: "Certificate for a significant contribution", "Certificate for an extraordinary contribution" and "Certificate for outstanding services to CIMO" and that the process for awarding the certificates should be administratively light. The meeting requested the Secretariat to finalize the criteria based on the discussions that took place during the meeting to ensure their compliance with WMO processes and terminology. The meeting agreed with the recognition scheme provided in Annex XVII.

5.5 The meeting encouraged the OPAG Chairpersons to inform their CIMO Expert Teams that certificates for important contributions to the work of CIMO would be issued at the end of the intersessional period (2014-2018).

5.6 The meeting welcomed the offer of Bruce Hartley to develop a form for the proposal of nominations for the two higher-level certificate types.

5.7 The meeting agreed that it is the responsibility of the CIMO president to finalize and authorize the list of experts who should receive certificates "in recognition of the important contribution to the work of CIMO during the intersessional period 2010-14".

6. CONTRIBUTION TO CONGRESS-17

6.1 The meeting was informed about the plans for the preparation of the Seventeenth World Meteorological Congress. The documents addressing the Instrument and Methods of Observation programme and CIMO activities will be sent to the CIMO president for review prior to their submission within the WMO Secretariat.

6.2 It is planned to organize a side meeting during Cg-17 to present the plans and progress made for the update of the International Cloud Atlas, as well as to present the major changes of the CIMO Guide.

6.3 The Secretariat will do its utmost to support CIMO Expert Teams in preparing outreach flyers (such as about the importance of traceability and the impact of the Minamata Convention on Mercury) that will be distributed to WMO Members at the occasion of Cg-17 to raise the awareness of decision-makers to these matters.

7. OTHER BUSINESS

Exploratory Workshop: Improving Surface-based Data Quality through Improved Standardization of Procedures

7.1 The meeting was informed of the outcomes of the Exploratory Workshop: Improving Surface-based Data Quality through Improved Standardization of Procedures that was held in Langen, Germany (3-5 Dec. 2014), which included 11 recommendations to be considered by the CIMO Management Group. The meeting noted that the tasks of the CIMO expert teams are already addressing/covering a number of these recommendations.

7.2 The meeting decided to develop a response/position on each of these recommendations. The meeting tasked Bruce Forgan, Bertrand Calpini, Ercan Büyübas and the Secretariat to develop such a response that would then be submitted to the CIMO MG for review and approval.

Expression of uncertainties in WMO documents

7.3 The meeting recalled the discussion the group had had on several occasions, in particular during it eleventh session (10-14 March 2014, Payerne, Switzerland), on the need for a common strategy for the expression of uncertainties in WMO documents (CIMO Guide, Manual and Guide on the GOS, OSCAR database and the Rolling Review of Requirement process). CBS IPET-OSDE has considered this matter. The meeting noted that the issue had not yet been settled – the CIMO Guide follows the BIPM rule with k=2 (95% confidence interval) while the OSCAR database follows the k=1 rule (67% confidence interval). This is an undesirable inconsistency.

7.4 The meeting recognized that the purpose of WIGOS is to enhance standardization, adhering as much as possible to internationally agreed definitions, to improve quality of observations. It is therefore important that the various communities that will make use of OSCAR have a clear understanding of the information provided in it.

7.5 The OSCAR database is presently in a critical phase of its development. It is imperative that this issue be clarified as soon as possible to ensure that the practices implemented in OSCAR are appropriate, that the terminology used is unequivocal and to make best use of financial resources, as late modifications could have significant financial implications.

7.6 The meeting therefore recommended that CIMO and CBS IPET-OSDE each develop independently a position paper clarifying the pros and cons of each solution (measurement uncertainty expressed as either k=1 or k=2) and that a teleconference be held between the two communities to come to a solution before the next meeting of ICG-WIGOS, so that it could be informed on the proposed strategy to be followed for OSCAR. The meeting requested Jitze van der Meulen and Bruce Forgan to develop this position paper for CIMO and tasked the Secretariat to approach CBS IPET-OSD and to convene a teleconference to address this issue prior to ICG-WIGOS-4 (Feb. 2015).

Action List

7.7 The meeting invited the Secretariat to develop an action list to ease the follow-up of actions agreed during the meeting. This is provided in Annex XVIII.

8. CLOSURE OF THE SESSION

8.1 The meeting thanked DWD for its hospitality and for the excellent facilities it had put to the disposal of the meeting.

8.2 The session closed on Tuesday 9 December 2014 at 13:30 hours

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Workplan of the Expert Team on Operational In-Situ Technologies (2014-2018)

No.	Task description	Priority [1]	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
1.	**Guidelines on combining information from composite observing systems**	**2**	**Toshihiro Hayashi** Ahmed Saad	1. Develop guidance material on QC procedures for precipitation amounts and intensity measured by precipitation gauges. 2. Develop guidance material on the use of precitipation gauge data in support of weather radar quality control	1&2. IOM Report or other document type if appropriate (CIMO Guide update, document for meeting or for AWS Portal, etc.)	1&2. 31.12.2016	1. 0 2. 0	CIMO MG-11 CIMO-16 §4.9, 4.10 (in collaboration with ET-ORS) Request from OSCAR Automatisation
2.	**Further develop and finalize guidelines on migration from manual to automated observations**	**1**	**Mike Molyneux** Bernd Mergardt Francesco Foti Ahmed Saad Henry Karanja	1. Teleconference to clarify structure and expected content 2. Finalize draft IOM report 3. Examine whether parts of the IOM report should be included into CIMO Guide	1. Teleconference 2. IOM Report 3. Updates to CIMO Guide	1. March 2015 2. 31.12. 2015 2. 31.12. 2016	1. 30 2. 0	CIMO-16 §4.12, CBS/OPAG-IOS (ET-AWS-6)/Doc. 7(1), (7.7.2010), submitted by Mike Molyneux Capture output from WIGOS AWS workshops Doc. Should cover concerns of climate community. Inform C1 - Task on Minamata and mercury.
3.	**Siting classification**	1	**Yves-Alain Roulet** Olaf Schulze Francesco Foti Toshihiro Hayashi	1. Address challenges faced by Members (Nordic countries in particular) with implementing the classification. Coordinate updates, if required. 2. Develop guidance material from the lessons learnt on how to implement the classification, including benefit achieved with it. 3. Maintain liaison with ISO re	1,3Updated classification if required 2 IOM Report with contribution from Norway, Austria, Switzerland, …(tbd)	1,3 2016 2. 2016	1. 31.12. 2015 2. 31.12. 2016 3. Ongoi	CIMO-16 §4.3, 4.4, 4.6, 4.7 To be integrated into OSCAR Contact M. Leroy to help finalize Ercan BUYUKBAS (B2, B3) A. Merlone to liaise with

[1] 1 : Must (WIGOS high priority or « low hanging fruit ») – to be addressed urgently, 2 : To be finalized by CIMO-17 (2018), 3: Not in WIGOS

No.	Task description	Priority [1]	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
			Andrea Merlone	maintenance of WMO/ISO standard			ng	relevant Meteomet2 actions.
4.	**Sustained performance classification for observing stations on land**	1	**Olaf Schulze** Francesco Foti Ahmed Saad Henry Karanja	1. Finalize the development of the classification 2. Develop guidance material on how to apply the classification	1. New WMO standard 2. Updated CIMO Guide	1. 31.12.2015 2. 31.12.2016	1. 50 2. 0	CIMO-16 §4.3 To be integrated into OSCAR See minutes last ET-Standardization meeting (26.6.2014) Yves-Alain Roulet to first clarify with M. Leroy
5.	**Metadata standards**	2	**Yves-Alain Roulet** Olaf Schulze Ahmed Saad	1. Ensure CIMO priorities regarding metadata are incorporated into WIGOS metadata activities. 2. Develop additional CIMO metadata contribution to the WIGOS metadata, if appropriate	1. Demonstrated contribution to TT-WMD 2. Expanded metadata standard (if appropriate)	Ongoing		CIMO-16 §4.2 Link within MeteoSwiss (TT-WMD with J. Klausen) Ercan BUYUKBAS (B2, B3) is CIMO Representative in ICG-WIGOS TT-WMD. CBS ET-AWS, already published (Guide to the GOS)
6.	**Standard for the classification of instruments for rainfall intensity measurements**	1	**Henry Karanja** (Luca Lanza)	1. Provide draft standard in English 2. Contact other relevant WMO Programmes (in particular CHy) 3. Further develop standard to meet their requirements 4. Incorporate comments from CHy and other stakeholders into the standard document	1. Draft standard 2. Progr. Contact & focal points nominated 3. Updated standard 4. Final draft standard submitted for approval by CIMO	1-Q1 2015 4-Q3 2015	50%	CIMO-16 §4.5 Note: Liaise with assigned CIMO Testbeds and Lead Centres Formalize link with CHy: via Secretariat CIMO-16 §7.60
7.	**Collaborate with ISO TC 180 on review of radiation standards**	2	**Wouter Knap (Jitze van der Meulen)**	1. Collaborate with ISO TC 180 through the WMO Secretariat for the review of the standards, on request from ISO	1. Provide contribution to ISO on/for revised standards	1. ongoing		CIMO-16 §4.8 Liaise with TT-Radiation Reference
8.	**Update of CIMO Guide**	1	**Mike**	1. Contact M. Leroy	1. Advice if update of	1-Q1		Contact M. Leroy to find out

No.	Task description	Priority [1]	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
	following publication of Ghardaia intercomparison report		**Molyneux** Bernd Mergardt Francesco Foti	2. Develop an update for relevant CIMO Guide chapters on recommended standard calibration procedures, etc. according to results of intercomparison	CIMO Guide is required 1.2 Updated CIMO Guide chapter *	2015 2-Q2 2015		what still needs to be done
9.	**Guidance on Wind Measurement and Reporting**	2	**TBD** (Jitze van der Meulen a.i.) Mike Molyneux	1. Liaise with CBS, CAeM and JCOMM to address concerns expressed by Hong Kong Observatory in regard to the measurement and reporting of wind 2. Organize the revision of relevant WMO guidance documentation as required.	1. Doc. on how to address concerns expressed by CIMO-16 2. Updated WMO guidance material on measurement and reporting of wind	31.12.2016		3 recommendations from CIMO-16 §4.38-4.41 BUFR vs CIMO Guide → consistency needed
10	**Liaise with cost action on snow measurements**		**Y.-A. Roulet**	1. Monitor progress of action, inform CIMO MG of relevant activities and inform COST ES1404 of possible links to CIMO and relevant CIMO activities 2. Incorporate relevant outcomes of CAST ES1404 into CIMO Guide. 3. Develop proposal for required follow-up acttivities by CIMO, if appropriate	1. Regular com. with CIMO MG and COST action 2. Update CIMO Guide chapter 3. Recommendation for follow-up activities during 2018-2022	1. On-going 2. Sept. 2017 3. March 2018		Cost action ES1404

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Workplan of the Expert Team on Developments in In-Situ Technologies (2014-2018)

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
1.	**Performance of new in situ technologies:** **a) Upper Air** **b) Surface T, P, RH** **c) Wind** **e) Precip** **f) AWS (including low cost AWS)** **h) Clouds, Vis, Pwx** **i) Trace Gas Measurement** **j) Solar radiation,** **k) individual lightning sensors.**	**a) Dubovetskiy** Ford **b) Warne** **c) Hietanen** **e) Lejbjuk** **f) de Podesta** **h) Wauben** Di Pasquale **i) Ford** **j) Warne** Pevny **k) Warne** Pevny	1. Monitor and review performance of new in situ surface and upper-air technologies and measurement techniques 2. Identify and report significant developments and trends	1. Report on findings 2. Recommended updates to CIMO Guide 3. Documentation on guidance for the use of Low Cost AWS.	06/2016 06/2017		CIMO-16 §4.19 Guo to link with ET-A1 on impacts of siting class, rather than include it here Re j), liaise with relevant ET tackling these topics.
2.	**Review outputs of assigned Lead Centres (Lindenberg, Chupungnyeong)**	**Dubovetskiy** Di Pasquale	1. Inclusion of guidance material in IOM reports 2. Update CIMO Guide as required to take into account technological developments	1 Documentation on guidance material 2. Recommended updates to CIMO Guide	06/2016 06/2017		
3.	**Investigate and provide guidance concerning design and installation of, a) instruments and b)measurement infrastructure , to sustain measurements in extreme weather conditions, such as in polar and alpine regions**	**a) Warne,** Dubovetskiy, Pevny **(Instruments)** **b) Lejbjuk,** Nomura**,** Guo, Pevny **(Infrastructure)**	1. Identify and review existing guidance material and develop new material on the optimal use of methods to measure severe hydrometeorological events and conditions.	1.1 Update list of existing documents 1.2 Draft report on severe conditions 1.3 New text for CIMO Guide on hardening methodologies	1.1 12/2015 1.2 06/2016 1.3 06/2017		CIMO-16 Doc. 4, §4.14, 4.26, 7(3).8, 7(4).4 Note: include guidance developed in collaboration with EC-PORS. Collaborate with Uni Wisconsin expert(s)
4.	**Polar Observations**	**Peter Lejbjuk**	1. Assist GCW in defining best practices for snow measurement, based on	1. Provide guidance document to GCW.	12/2016		Liaison with SPICE Project Team

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
			outcomes of SPICE. 2. Identify sensors and systems suitable for Polar and Alpine operation.	2. Possible IOM Report or other document	12/2016		
5.	**Review development of new radiation reference instruments**	**Not req**	No action required this intersessional period. This task dealt with by TT-RadRef	Nil	N/A	N/A	ET-MR&ACM-2, para 7.2.2 CIMO-16 §4.15 Dealt with by TT-RadRef.
6.	**Automatic cloud type and amount observations**	**Wauben**, Guo, De Podesta Di Pasquale	1. Review automatic cloud observation practices and instrumentation. 2. Identify the measureand 3. Investigate the prospects for establishing traceability of such observations to recognized standards.	1a Guidance on best practices 1b Update of CIMO Guide chapter 2 Guidance document or IOM Report 3 Report on the scope for establishing traceability for these observations	1a. 06/2016 1b 06/2017 2 06/2017 3 12/2017		CIMO MG-11
7.	**Instrument performance monitoring**	**Warne** De Podesta, Guo, Hietanen, Arrifudin, Pevny Ford	1. Review national practices. 2. Develop a framework on instrument performance monitoring, including what to monitor and how.	1-2a. Instrument performance monitoring framework. 2b. Update of CIMO Guide	06/2016 06/2017		CIMO-16, §4.13, §6.27 Note: focused on instrument performance metadata (e.g., battery voltage) Link with ET-A1 Task 4 and with ET-B1
8.	**Use of environmentally friendly radiosondes**	**Dubovetskiy** Nomura Warne Hietanen	1. Propose WMO position on the use of environmentally friendly radiosondes 2. Collaborate with other international organizations (CEN, HMEI) if and as relevant in development/ review of related standards	1. Report including recommendation to be submitted for approval to CIMO-MG 2. Development of joint standard	1. 06/2016 2. As needed		CIMO-XV, §5.9 Where possible use existing guidelines (national, HMEI member)
10.	**Soil Moisture**	**Warne** **Wauben**	1. Review national practices	1. Information document 2. CIMO Guide update (if appropriate)	1. 06/2016 2. 06/2017		Liaise with CHy, CAgM

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
11	**Economical AWS measurements**	**Warne ?**	1. Review alternative technologies	1. Guidance documentation for Members on economical alternatives to AWS	Q1/2017		Consider TAHMO project, Farmers raingauges, Etc Include low-cost all-in-one AWS

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Workplan of the Expert Team on Instrument Intercomparisons (2014-2018)

No.	Task description	Person responsible	Action/Milestone	Deliverables	Deadline for deliver.	Status	Comments
1.	**WMO Solid Precipitation Inter-Comparison Experiment (SPICE)**	**R. Nitu** E. Vuerich	1. Monitor progress of SPICE 2. Incorporate guidance material from SPICE Final Report into updates of CIMO Guide	1. Report to OPAG Chair 2. Updated CIMO Guide	1. Q2 2016 & Q1 2018 Q2 2016		CIMO-16 §4.11, 4.21-22, 4.31, 7(7).6, 8.7 Final Report of SPICE due in 2016
2.	**Outcomes of the national China solid precip intercomparison**	**Guo Yatian**	1. Share results and outcomes of China solid precipitation intercomparison	Document on China intercomparison outcomes	Mid 2015		
3.	**Liaison with other ETs, RAs and communities (BSRN, GAW, WCRP, etc.) on results of and intentions for intercomparisons**	**E. Vuerich,** M. de Haij, A. Lilja with support of all	1. Liaise with other CIMO ETs and external communities on plans/on-going/completed instrument intercomparisons 2. Collect links to published reports of national/regional intercomparisons 3. Coordinate updates of relevant CIMO Guide chapters related to inter-comparisons with these groups and CIMO Editorial Board as required	1. Report to OPAG-A Chairs regarding plans for intercomparisons 2. List of relevant web links and ongoing projects 3. Update of relevant CIMO Guide Chapters	1. Q2 2016 & Q1 2018 2. Yearly in April 3. Q2 2018		CIMO-16 §4.11, 4.28, 4.29, 4.30, 4.31, 4.33
4.	**Priorities for future intercomparisons**	**B. Santoso** with support of all	Assess priorities for future CIMO intercomparisons	1. Updated prioritized list of future intercomparisons	1. Dec. 2017		CIMO-16, §4.29, 4.33, 7(12).6 Use CIMO-approved shortlist as the basis
5.	**WMO Radiation Intercomparisons**	**W. Finsterle** 4. B. Santoso	1. Monitor progress of International Pyrheliometer Comparison XII (28 Sept. – 16 Oct. 2015) 2. Monitor progress of International International Pyrgeometer Comparison II (in tandem with IPC XII) 3. Ensure that final reports of intercomparisons are published as an IOM report 4. Liaise with Regional Radiation Centres on plans for reg. rad. interc.	1. Report to OPAG Chairs 2. Report to OPAG Chairs 3. IOM Report 4. Report to OPAG Chairs	1. Q2 2016 2. Q2 2016 3. Q2 2016 4. Q2 2016		CIMO-16 §4.11, 4.23-25, 4.29,4.31

No.	Task description	Person responsible	Action/Milestone	Deliverables	Deadline for deliver.	Status	Comments
6.	**Instrument Intercomparison for upper air measurements**	**R. Philipona** & Task Team	Carry out feasibility study	1. Propose TT membership 2. Proposal(s)/ plan for conducting an intercomparison	1. Nov. 2014 2. Q2 2016		CIMO-16 §4.11, 4.27, 4.28, 4.29,4.31, 4.33, 7(12).5
7.	**Instrument Intercomparison for volcanic ash/aerosol detection**	**F. Besson**, M. de Haij, & Task Team	Carry out feasibility study	1. Propose TT membership 2. Proposal(s)/ plan for conducting an intercomparison	1. Nov. 2014 2. Q2 2016		CIMO-16 §4.11, 4.28, 4.29,4.31, 5.24

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Workplan of the Expert Team on Aircraft-based Observations (2014-2018)

No.	ToR	Task Description	Person Responsible	Action	Deliverables / Outcome	Comm.	Deadline for Delivery	Status (%)	Comments
1	1)	Coordinate with CBS ET-ABO on Work Plan & Budget	Ch-ET-AO, SO/ARO	1. Representative of ET to attend ET-ABO-2 (2015); 2. Work Plan & Budget to be compiled & approved on at least an annual basis. 3. Regular Work Plan WebEx sessions to be held.	Harmonised Work Plan & Budget for the ABO Program. Report to ET-AO	Q4 2014	Ongoing	N/A	• Chair attended ET-ABO-1
2	2)	Meeting of ET-AO	Ch-ET-AO, SO/ARO	Meeting of ET-AO, Q2 2015 Meeting of ET-AO, Q1 2018, prior to CIMO Session	1. Work Program advanced; 2. Report to CIMO	Q4 2014	Q1 2018	0	Meeting of TT-AO-1 held 18-20 Feb 2014.
3	3)	Investigate AMDAR Temperature Bias	S.d.Haan	1. Review of relevant reference material 2. Consultation with avionics/sensor experts	1. Report to ET-AO and CIMO 2. CIMO IOM Report	Q1 2014	Q2 2015	25	May require funding to complete a study on onboard issues, such as deicing. Ref: WMO AMDAR Panel Aircraft Observing System Data Management Workshop, Section 5.1,

No.	ToR	Task Description	Person Responsible	Action	Deliverables / Outcome	Comm.	Deadline for Delivery	Status (%)	Comments
4	3)	AMDAR and water vapor measurement (WVM) integration into existing avionics and airframes	A.Hoff, G.Meymaris, S.Stringer, B.Ford, SO/ARO	1. Drafting and review of plan. 2. Finalise plan as part of the ABOP Strategy & Implementation Plan (A-SIP)	Strategic Plan	2012	Q1 2015	75	This needs to be harmonized with the the A-SIP. Ref: WMO AMDAR Panel Session 15 Fin. Rep. 4.2.1. Incorporate: • Ownership of STCs • Collaboration on STC costs • Integration into airframes AMDAR Software requirements
5	3)	AMDAR and water vapor measurement (WVM) as standard accessory on commercial aircraft	A.Hoff, G.Meymaris, S.Stringer, B.Ford, SO/ARO	1. Drafting and review of plan. 2. Finalise plan as part of the ABOP Strategy & Implementation Plan (A-SiP)	Strategic Plan	2012	Q1 2015	50	Incorporate: • Formulation of IP into WMO Project, perhaps in collaboration with ICAO. Ref: WMO AMDAR Panel Session 15 Fin. Rep 4.2.1.

No.	ToR	Task Description	Person Responsible	Action	Deliverables / Outcome	Comm.	Deadline for Delivery	Status (%)	Comments
6	3)	Turbulence (EDR) Implementation in AMDAR - Develop IP for EDR	G Meymaris, S.Taylor, T.Farrar, SO/ARO	1. Drafting and review of plan. 2. Teleconferencing of collaborators. Liaise with NCAR on software requirements; 3. Identify possible airline partner for trial.	EDR IP	Q3 2013	Q1 2015	50	Possibly include: • A trial program with a European airline (the E-AMDAR Team discussing possibility with Air France). Delay in discussing with airline. Ref: WMO AMDAR Panel Session 15 Fin. Rep 4.2.2.
7	3)	Turbulence (EDR) Implementation	G Meymaris	1. In collaboration with ET-ABO, undertake activities as required to facilitate AMDAR EDR monitoring program.	• EDR monitoring program operational	Q2 2015	Q4 2018	0	

No.	ToR	Task Description	Person Responsible	Action	Deliverables / Outcome	Comm.	Deadline for Delivery	Status (%)	Comments
8	3)	Study on Current & Future Comms & Technology Impact on AMDAR	SO/ARO, S.Taylor, D. Arodi.	1. Write Statement of Work 2. Identify consultants 3. SSA in place Monitor progress	1. Kick off webex with consultant (Sep 2014). 2. Study and recommendations produced. Two sections to cover Executive Summary and Technical terminology.	Q3 2013	Q1 2015	20	Ref: WMO AMDAR Panel Session 15 Fin. Rep 4.3.2.
9	(4)	Update and maintain the AOSFRS	ET-AO	1.	AOSFRS Maintained	Q4 2014	Q4 2018	0	• No current requirement for updates identified
10	4)	AMDAR Software Development & Availability	S.Taylor, SO/ARO	1. Approach Teledyne Controls re AOSFRS implementation; 2. Approach other avionics vendors	Integration of AMDAR into avionics systems.	Q3 2013	N/A	Ongoing	Work towards availability of AMDAR software as a catalogue item of delivery for avionics systems. ET-AO agreed on more proactive approach possibly involving face to face meetings necessitating travel of Members.

No.	ToR	Task Description	Person Responsible	Action	Deliverables / Outcome	Comm.	Deadline for Delivery	Status (%)	Comments
			ET-AO, SO/ARO	Development of Generic AMDAR Onboard Software Modules: 1. Determine viability of project. 2. Develop Description of Work and requirements. 3. WMO Tender for job.	Suite of generic AOSFRS-compliant modules for deployment with participating airlines and avionics vendors.	Q3 2014	Q4 2015	10	• Initial discussions with vendors. • Honeywell and Teledyne contacted. • Other vendors and aircraft manufacturers to be contacted (Q4 2014).
11	4)	Boeing 777 AMDR Software Dev.	Ch-ET-AO, Ch/ET-ABO, SO/ARO,	1. Finalise negotiations with AFR and KLM in consult. with E-AMDAR & Meteo-France 2. Review quotation; 3. Provide advice on specifications and requirements.	B777 AMDAR Software application	2012	Q2 2015	20	• Combined action with ET-ABO • Project has been further delayed. • Next meeting arranged Nov 2014. Ref: WMO AMDAR Panel Session 15 Fin. Rep 4.4.7.
12	4)	Develop and specify standard for AMDAR Data Optimisation System	D.Body	1. Determine requirements (consult with FPs); 2. Draft specification; 3. Conduct review; 4. Publish spec.	Addition to WMO guidance material.	Q4 2014	Q3 2015	25	Develop a functional specification that can be included in the Manual on WIGOS or in CIMO Guide

No.	ToR	Task Description	Person Responsible	Action	Deliverables / Outcome	Comm.	Deadline for Delivery	Status (%)	Comments
13	5)	Monitor & Review reports from WVSS testing	A.Hoff	1. Review reports. 2. Report to TT-AO-1 3. Provide summary report on DENCHAR test results. 4. Provide ET-AO and ET-ABO with updates.	1. Report to CIMO. 2. Updates to ETs.	Q3 2013	Ongoing	N/A.	Ref: WMO AMDAR Panel Session 15 Fin. Rep 4.2.1.
14	5)	Monitor & report on impact assessment results of TAMDAR humidity & other parameters by MetOffice	ET-AO	1. Review reports and analyse results. 2. Report to ET-AO-1. 3. Provide updates to ET	Report to CIMO	Q3 2013	Q2 2015	20	Delay to installation of TAMDAR on FAAM aircraft, now scheduled for Oct 2014.
15	3)	Develop & Implement plans for AMDAR & WVSS inter-comparison	S.d.Haan	1. Determine requirements; 2. Analyse options; 3. Draft Plan; 4. Implement & report (IOM).	AMDAR & WVSS Inter-comparisons Plan	Q4 2013	Q2 2015	20	
16	6)	Prepare a paper on the status of WVSS-II validation	B. Ford & Collaborators	1. Prepare outline and scope 2. Identify contributors 3. Research and draft 4. Review 5. Publish	IOM Report	Q3 2013	Q4 2014	90	Provide a summary on all scientific and operational aspects of the WVSS-II sensor and prepare a paper to be published as an IOM report.
17	6)	Review & Update Aircraft-based Obs Reg. Mat. In CIMO Guide	ET-AO	1. Review current status of material and identify requirements for update; 2. Coordinate & undertake update; 3. Review and complete; 4. Provide to CIMO Editorial Board.	CIMO Guide on Aircraft-based Observations updated.	Q1 2014	Q4 2018	0	

No.	ToR	Task Description	Person Responsible	Action	Deliverables / Outcome	Comm.	Deadline for Delivery	Status (%)	Comments
18	7)	Attend meetings of relevance to AMDAR Technical Dev.	ET-AO, SO/ARO	1. Develop list of aviation committees and reps on P&C wiki.	Meetings attended. Reports produced for CIMO and Secretariat	Q2 2013	Ongoing	N/A	This may include: • Meeting with avionics vendors; • SO/ARO & S.Taylor met with A.Hoff in Dec 2013 in Offenbach for Task 19.
19	4)	Maintenance of AEEC ARINC 620 Specification	S.Taylor, SO/ARO, A. Hoff	1. As necessary, work with AEEC DataLink Systems Sub-Committee to maintain the Met. Report in the ARINC 620 standard.	Met. Report V6 defined in the AEEC ARINC 620 spec.	Q4 2013	Q4 2014	95	• Will require travel support for work team and to attend AEEC meetings
20	4)	Interaction with AEEC AOC	ET-AO, SO/ARO	1. Review existing documents and reports to determine requirements for ET-AO 2. Seek membership of AOC and attend meetings	Liaison with Aviation Industries. Report to ETs where appropriate.	Q2 2014	Ongoing	N/A	• SSC and AOC are trying to harmonize requirements for data link in A633 and A620. • ET-AO should determine any implications for AMDAR.

No.	ToR	Task Description	Person Responsible	Action	Deliverables / Outcome	Comm.	Deadline for Delivery	Status (%)	Comments
21	3)	Study of UAV technologies.	ET-AO	1. Investigate possible applications of UAV/UAS developments for reporting of meteorological parameters. 2. Attend meetings of relevence	1. Reports to ET-AO and CIMO. 2. Mission Report from UAV Conference (Oct 2014).	Q3 2014	Ongoing	N/A	• Chair ET-AO will attend UAV Conference Oct 2014. • UK Met Office are investigating UAV technology for meteorological research.

Workplan of the Task Team on Radiation References (2014-2018)

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
1.	**Traceability of solar radiation measurements - WRR-SI Relationship**	**1. Finsterle, Fox, Monte** **2. Finsterle , Fox, Monte** **3. Groebner & Tsvetkov**	1. a.Review and evaluate recent development of reference instruments for solar radiation b. PMOD investigations on Cryogenic radiometer in relation to WRR. 2. a. Assess difference to reference in present use (WRR) b. Develop recommendations on requirements and timeliness for a modification of the current references (if required develop an implementation plan for the change) 3. Provide advice on the method by which current data bases (WRDC & BSRN) and future IPCs and RPCs can modify support the solar irradiance traceable hierarchy	1. a. Presentation IPC 2015;. b. Report to CIMO MG 2016 2. a. Progress report. b. Draft recommendation for adoption by CIMO-17 (2018) 3. a. Interim report on potential impact of a small percentage change in the solar reference on solar data bases and users. b.Recommendation on modification of present WRDC and BSRN DB and future submission to reflect WMO solar reference changes.	1. MG 2016 2. a. MG 16. b. MG 2017 3. a.MG 2016 b.MG 2017		CIMO-16, §4.15 Note 1: Indicate whether a WMO endorsed multiplier with an associated uncertainty that relates the WRR to the SI should be introduced. Note 2: Provide a recommendation on what reference should be used for future solar radiation measurements by WMO Members (if not the WRR, when it should be introduced) Note 3: Liaise with respective Euramet project(s) CIMO-16, §8.6
2.	**Traceability of terrestrial (infrared) radiation measurements**	**1. Groebner** **2. Groebner** **3. Groebner** **4. Groebner** **5.ab Ohkkawa** **5cd Forgan**	1. Review and evaluate recent development of reference instruments for terrestrial radiation 2. Assess difference to reference in present use (WISG) 3. Develop recommendations on requirements and timeliness for a modification of the BSRN data bases 4. Provide advice on the potential impacts of the	1. Progress report to CIMO MG 2. A. Progress report b. Report to BSRN community c. Draft recommendation for adoption by CIMO-17 (2018) on future WIR 3. a. Progress report MG 2015	1. MG 2016 2. a MG 2016 b. BSRN 2017 c. MG 2017 3. a MG 2015 b. BSRN 2016		CIMO-16, §4.15 CIMO-16, §8.6 Note: Liaise with ET-A3

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
			change to stakeholders including changes to be traceability requirements 5. Conduct inter-comparisons at high total column water vapour to examine the impact on infrared measurement traceability	b. Progress report MG 2016 c. Report tto BSRN community d. IOM on infrared traceability framework 4.a. Progress report MG 2015 b. Progress report MG 2016 c. Report to BSRN community d. If required updated CIMO Guide section on infrared measurements 5 a. Inter-compariosn Japan 2015 b. report on Japanese compariosn c. Inter-comparison Australia 2015 d. report on inter-comparison	c. MG 2017 d. 2018 4. a MG 2015 b. BSRN 2016 c. MG 2017 d. 2018 5a. report to MG 2016 b. IOM report 2017 c. report to MG 2016 d. IOM report 2017.		
3.	**Spectral Irradiance standards**	**Forgan Groebner**	1. Seek community guidance on the need for WMO to provide a spectral irradiance standards. 2. If desired examine potential focus areas for spectral irradiance standards.	1. Hold a session at IPC 2015 to examine the need for spectral irradiance standards. 2. a. Report on progress b. Report on progress c. IOM report	1. MG 2016 2. a. MG 2016 b.. MG 2017 c. 2018 3. MG		

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
			3. If needed a recommendation on the potential spectral irradiance references for operational use by the WMO community.	3. Draft recommendation for adoption by CIMO-17 (2018)	2017		
4.	**Future responsibility for solar and longwave radiation references**	**Forgan Finsterle Groebner Fox Monte**	1. Examine the effectiveness of the inter-comparisons at IPCs to support and sustain the global traceability hierarchy of the WRR and WISG, and the outputs of WMO radiation centres. 2. Advise WMO if it should still define and be accountable for the solar and longwave references embodied in the WRR and WISG, and if not recommend options.	1. Report on the effectiveness of the comparisons at the IPCs. 2. a. Report on the continuation of responsibility and accountability of solar and longwave reference; b. If required, a draft transition plan, and a draft recommendation for adoption by CIMO-17 (2018)	1. MG 2016 2. a. MG 2016 b.. MG 2017		CIMO Guide Part I, Annexe 7.C.

Note 1: All CIMO MG reports to be coordinated by the Chair of the task team.
Note 2: All recommendations for endorsement of CIMO 2018 must be with the CIMO MG by the CIMO 2017 meeting.
Note 3: Unless otherwise specified the person listed in the 'Person responsible' column is the lead for the activity but other members of the TT can assist.

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CIMO MG-13, ANNEX VII

Workplan of the Expert Team on Operational Remote-Sensing Technologies (2014-2018)

CIMO-16, 5.2

(ET-ORS deals with **all aspects** of wind profilers, weather radars and lightning detection systems)

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
1.	**Radar wind profiler operations, including:** **a) profiler selection** **b) siting considerations** **c) networking considerations** **d) integration with other systems** **e) data quality control** **f) uncertainty and traceability of output data** **g) Sustainability and resource requirements.**	**Lehmann** Boers Kane	1. Review available national and international documentation on the operational use of radar wind profilers, including as that available from Testbeds. 2. Based on the existing information, prepare guidance material (IOM report) on all aspects of the operation of radar wind profilers 3. Update the CIMO Guide information on radar wind profilers	2.a) Draft IOM report on the operations of wind profilers 2.b) Finalise IOM Report 3.a) Draft Update of CIMO Guide (possibly new chapter).	1.) 02/2015 2.a) 12/2015 2.b) 12/2016 3.a) 12/2017		CIMO-16 §5.12, 5.13 Liaise with CBS ET-SBO Note information contained in IOM Report No 110 and http://www.wmo.int/pages/prog/www/OSY/Meetings/ET-SBRSO_ET-RSO-2011/DocPlan/5.1(1)_Profiler_Regional_National_Status.pdf See presentations from TECO 2014 on profiler selection (Scott McLaughlin) and from MMC 2014 (Alexander Haefele) on traceability
2.	**New and emerging radar wind profiler technologies**	**Ice** Lehmann	1. Review current developments in radar wind profiler technology.	1) Report on new and emerging wind profiler technologies, if appropriate.	As available		Contact manufacturers through HMEI Rep. (Vaisala, Detect Inc., ATRAD, Degreane, Scintec,…)
3.	**Dual polarization weather radar**	**Ice** Kong Tsukamoto Urban Sireci	1. Collect information on the current status of use of dual polarization radars (principles, QC, QPF applications, use, costs, benefits of dual polarization technology, C-band vs. X-band). 2. Prepare guidance material for members.	2a) Draft IOM report on the use of dual polarization radars. 2b) Finalise IOM report 2c) New CIMO Guide section on the use of dual polarization radars	1. Ongoing 2a) 12/2015 2b) 12/2016 2c) 12/2017		Refer to CIMO-16, §5.6 http://www.wmo.int/pages/prog/www/OSY/Meetings/ET-SBRSO_ET-RSO-2011/DocPlan/3.3.1_Development_of_Polarization_Technology.pdf http://www.wmo.int/pages/prog/www/OSY/Meetings/ET-SBRSO_ET-RSO-2011/DocPlan/INF.3.3.1_Dual_polarization_Meteo_France.pdf

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
4.	**Operational calibration of weather radars**	**Pei Chong** Ice	1. Research on cross calibration technology and automatic correction methods in weather radar networks. 2. Research on operational calibration method for dual polarization weather radar, especially online calibration and compensation of differential reflectivity, which indicates consistency in horizontal and vertical channels.	1) Document on the research results of cross calibration technology in weather radar networks. 2) Document on the research results of operational calibration methods for dual polarization weather radar.	1.) 12/2016 2.) 12/2017		Contributions from domestic radar producers in China CIMO-16, §5.9
5.	**Operation of weather radars in mountainous regions.**	**Kong** Sireci Kane Pei Chong Ice Tsukamoto Waniha	3. Gather information from different countries on strategies employed 4. Synthesize information obtained into general guidance material	2a) Information document (possibly IOM report) on operation of radars in mountainous regions. 2b) New section for CIMO Guide chapter on weather radars, if warranted.	1. 06/2015 2a. 12/2015 2b. 12/2016 (if req)		Note http://www.wmo.int/pages/prog/www/OSY/Meetings/ET-SBRSO_ET-RSO-2011/DocPlan/3.4.2_Radar_at_high_altitude_sites-20111128.pdf CIMO-16, §5.7 CIMO guide contribution TBD Consult with Urs Gehrmann (invited expert, Meteoswiss)
6.	**Weather radar data and metadata exchange**	**Sireci** Kane Rich Urban	1. Contribute CIMO input to the CBS ET-SBO Task Team on Radar Data Exchange 2. Work closely with Turkish Meteorological Service in the design and implementation of the second version of the weather radar metadatabase	1) Input to CBS ET-SBO Task Team 2) Liaison with TMS on requirements for radar metadata, as required	1. As req 2. As req		CIMO-16, §5.3 Exchange of products (reflectivity, radial Doppler, derived VVP Winds): data exchange studies, collect info about different formats BUFR, HDF5, ODIN CIMO developed radar metadata database, now handled by CBS ET-SBO

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
							CIMO input to CBS required Support task for ET-ORS, on request
7.	**Evolution of weather radar technologies: New developments, resource requirements, spectrum allocation constraints.**	**Pei Chong** Ice	1. Review current developments in weather radar technology: (e.g. solid state transmitters, phased array antennas, low cost X-band radars, use of radio spectrum and RFI issues, health and safety etc.)	1) Report on new and emerging weather radar technologies, if appropriate.	12/2017		Contact manufacturers through HMEI Rep. with regard to aspects mentioned. Contact with B.3 “Theme leader on Radio-Frequency Protection”. CIMO-16 §5.10, 5.11
8.	**Collaborative adaptive observation mode of weather radars**	**Pei Chong** Ice	1. Research on collaborative adaptive observation mode of weather radars, focusing on temporal and spatial synchronization, as well as echo consistency /product comparability in radar networks.	1) Document on research results of collaborative adaptive observation mode of weather radars.	12/2016		CIMO-16, §5.8
9.	**Intercomparisons of weather radar algorithms and products (Radar Quality Control and Quantitive Precipitation Intercomparison (RQQI))**	**Kane** Leijnse	1. Monitor progress with the intercomparison 2. Publish results of the analysis	2.1) IOM report on the results of the intercomparison 2.2) Update CIMO Guide Chapter on weather radar	2.1) 12/2016 2.2) Dec 2017		CIMO-16, §5.5 Invited experts on an opportunity basis: Paul Joe, project leader RQQI, and Daniel Michelson, BALTRAD, communication through WMO Secretariat Activity depending on RQQI activity, monitoring task for ET-ORS
10.	**Lightning detection systems**	**Hettrick** Pei Chong	1. Assemble existing information and propose improvements to current methods of assessing the detection efficiency and location accuracy of lightning detection networks 2. Review the use of lightning data in integrated	1a) Report on current status of lightning detection systems 1b) Update CIMO Guide 2) Report on use of lightning data in integrated obs products .	12/2016 6/2017 6/2017		(Leftover from previous task team) Note existing guidance doc from FMI. Search for additional literature / reports Contact HMEI and ask for contacts/input

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
			observations products.				
11.	**Lightning detection systems: Testbed and Intercomparisons**	**Pei Chong** All	1.Assist CMA, on request, regarding the development of a CMA testbed for lightning detection systems 2. Examine the feasibility of a CMA intercomparison of lightning detection systems and provide advice to CMA, if requested, to assist in planning such an intercomparison	Guidance documents 1) regarding the establishment of a new CIMO testbed 2) regarding the planning of an intercomparison experiment	1 as req. 2 as req.		CMA expects to submit a proposal late in 2015.
12.	**Integration of observations from different rainfall observation systems**	**Urban** Kane Ice	1. Evaluate issues related to integrating precipitation observations from weather radars, satellites and rain gauges 2. Propose standardized techniques for data integration	1-2. Guidance document on integration of rainfall observations from different systems. a) Draft b) Final document	a) 07/2015 b) 07/2016		CIMO-16, §4.9, 4.10, 5.8 Note: in collaboration with ET-OIST Draft based on experience at MeteoFrance and within Europe
13.	**Access to publications on wind profilers, radars and lightning detection systems**	**Lehmann** All Secretariat	1. Identify national and other publications on wind profilers, weather radars and lightning detection systems 2. Provide internet access to those publications from the WMO webpages	1. List of publications 2. Webpage providing access to those publications	ASAP		CIMO MG-11 CIMO-16, §5.2 Continuous task.
14	**Outcomes of Exploratory Workshop**	**Lehmann**	Follow-up on outcomes of exploratory workshop	TBA	TBA		

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Workplan of the Expert Team on New Remote-Sensing Technologies (2014-2018)

CIMO-16 §5.14, 5.15, 5.16

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
1.	**Instrument intercomparison for aerosol / volcanic ash detection.**	**Apituley** Donovan Ristori	1. Assist in conducting a feasibility study for an intercomparison on various techniques for aerosol/ volcanic ash detection 2. Report to CIMO MG on the findings of the study 3. Prepare a plan for such an intercomparison if feasible	1. Report on feasibility study. 2. Plan for intercomparison	12/2015 TBD		CIMO-16 § 5.24 In liaison with ET-II May need to involve seismologists community Will there a need for 'portability' of the intercomparison?
2.	**Passive microwave profilers**	**Chan** Cucurull	1. Survey the use of MWPs by NMHSs 2. Further develop draft guidance material on operational use of passive microwave profilers and its potential integration with satellite data. 3. Review relevant CIMO Guide chapter and develop update if appropriate	1/2. IOM Report on MW Profilers 3. Updated CIMO Guide Chapter	12/2015 12/2016		CIMO-16 Doc. 5, §5.18 Note existing draft doc available from WMO secretariat
3.	**Lidar Standards**	**Apituley** Chan	1. Provide WMO input to ISO TC146/SC5 development of a joint WMO/ISO standard on Doppler wind lidar. 2. Provide advice to CIMO MG on the merit of development of other joint WMO/ISO standards. 3. Collaborate with ISO TC146/SC5 working group on maintenance of ISO lidar standards.	1. WMO/ISO standard on Doppler wind lidar	1. 06/2015 2. Ongoing 3. Ongoing		CIMO-16, §4.6 CIMO-16, §5.22 CIMO-16, §8.3

4.	**Monitor, evaluate and report on development and implementation of new remote-sensing technologies and their operational application (excluding weather radars, radar wind profilers and lightning detection systems)**	a. **Tulley** b. **Cucurull** de Haan Tulley c. **Apituley** Ristori Sakai d. **Sakai** Apituley Roininen e. **de Haan** Cucurull Apituley Chan f. **Donovan** g. **Ristori** Apituley Tulley Roininen Donovan h. **Cucurull** All	Review, evaluate and report on development and implementation of various new remote-sensing technologies and their potential/readiness for operational application, including path to operational use and traceability to SI, for: a. MWR, b. GNSS c. Raman WV lidar d. DIAL lidar e. Doppler wind LIDAR f. cloud radars g. aerosol&volcanic ash detection h. other (incl. simple, cheap technology)	1. Updated reports on performance, implementation and operational use of various systems. 2. IOM or other report(s) on new RS technologies (e.g. Operational use of LIDARs) 3. Relevant CIMO Guide updates (as required)	1.1 12/2015 1.2 06/2017 2. As req 3. As req		CIMO-16 §4.17, 5.15, 5.16, 5.17, 5.18, 5.19, 5.20, 5.21, 5.22, 7(5).3, 7(5).4 Note 1: Ensure due consideration of new technologies which are cheap and simple to operate and maintain. Note 2: Take into account reports from previous intersessional period. Note 3: Liaise with GRUAN on WV Lidars, etc. Note 4: Include FTIR
5.	**Review outputs of assigned CIMO Testbeds (Lindenberg, Hohenpeissenberg, Payerne, Izana)**	**De Haan** (Berger/Beyrich, Plass-Duelmer, Ruffieux, Cuevas)	1. Monitor and review outputs of assigned CIMO Testbeds and Lead Centres 2. Assess need to, and develop if required, up-dates for relevant parts of CIMO Guide.	1. Report to OPAG Chair summarizing main outputs of testbeds relevant to ET Terms of Reference 2. Revised CIMO Guide Chapters	1. 6 monthly 3. 06/2017		CIMO-16, §5.15
6.	**Uncertainty and traceability to SI of remotely sensed**	**De Haan** Cucurull	1. Identify one technology (from Task 4. above, e.g. GNSS) for which SI traceability and	4. Document or IOM Report on uncertainty and	12/2016		Note existing draft document at http://www.wmo.int/pages/prog/www/IMOP/meetings/RS-NT/ET-

	atmospheric vertical profiles.		quantification of uncertainty is tractable, and develop guidance material on this.	traceability of remotely sensed vertical profiles.			NTTB-1/Doc%209_Traceability.doc CIMO-16 §5.25, 5.26

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Workplan of the Theme Leaders on Radio Frequency Protection (2014-2018)

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
1.	**Liaison with CIMO ETs and TLs on radiofrequency issues**	**Sireci/ Franc**	1. Advise CIMO ETs/TTs/TLs on issues that should be addressed with respect to radiofrequency coordination (review SG-RFC reports and convey relevant parts to CIMO ETs and OPAG Chairs) 2. Coordinate investigations within CIMO, as required, to assist the work of SG-RFC. 3. Develop a listing of observing systems, the radio-frequency bands on which they rely and the tolerable levels of interference which they can withstand.	1. Document with advice to CIMO on current RF issues. 2. CIMO expert input into the work of CBS SG-RFC 6. Listing of R/F susceptibility of different observing systems. 3. Guidance documentation for Members' RF experts.	Yearly, following SG-RFC meeting Yearly, in due time for timely subm. To SG-RFC 11/2015		CIMO MG-11
2.	**Represent CIMO in CBS SG-RFC activities**	**Sireci/ Franc**	1. As far as possible, attend SG-RFC meeting and represent CIMO therein 2. Gather issues regarding radiofrequency from CIMO ETs/TTs/TLs and forward relevant issues of concern from CIMO to SG-RFC 3. Contribute to the activities of SG-RFC, especially, by providing CIMO input to the WMO position paper for WRC.	1. Document/mail sent to SG-RFC chair 2. a) Reports to SG-RFC 2. b) Report to OPAG Chair	Yearly Yearly Ongoing		CIMO-16, Doc. 5, §5.27
3	**Bandwidth Requirements for Global Radiosonde Operations**	**Sireci** Franc	Work with CBS in ascertaining minimum bandwidth continuance of global radiosonde operations in this band.	Draft IOM Report	11/2015		In collaboration with CBS
4	**Sharing arrangements for HF oceanographic radars**	**Franc** Sireci	Work with CBS and JCOMM to develop a sharing plan for HF oceanographic radars	Draft IOM Report	11/2016		

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
5	**Protecting Radar Operations from Wind Farms**	**Franc** Sireci	Update regulatory/guidance material regarding wind turbine siting close to weather radars and wind profilers	Update to WIGOS Manual / CIMO Guide	06/2017		Refer to Eumetnet OPERA study Also refer to ICAO actions..

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Workplan of the Expert Team on Operational Metrology (2014-2018)

No.	Task description	Person responsible and subteam	Action	Deliverable	Deadline for deliv.	Priority	Status [%]	Comments
1.	**Estimation of calibration uncertainty – traceability to SI**	**D.Groselj,** K.Premec, A.Mounir, T.Holfelder, N.Mander	1. Review document on computation of calibration uncertainties 2. Develop workshop on uncertainty calculations 3. Carry-out workshop	1. IOM report on calibration uncertainties 2a. Concept for Workshop 2b. Training units and associated presentations prepared. 3. Workshop carried out	1. Approved for publication 2a. July 2015 2b. Dec. 2015 2. TBD	M		CIMO-XV para 6.3 CIMO-16, Doc. 6, para 6.9 Workshop should also address how to establish calibration certificates Workshop could be done on-site, or possibly remotely (including RICs).
2.	**RIC inter-laboratory intercomparisons (demonstrating capabilities in achieving declared RIC calibration and measurement capabilities (CMCs))**	**RA-VI: D.Groselj,** F.Montariol, **RA-II & V: K.Nakashima**, F.Barcenas, **RA-I: A.Mounir**, **RA-IV & III: D.Walker**, D.Prescod	1. Set-up intercomparison kit for temperature, humidity and pressure (at least one, but preferably all 3 parameters) 2. Schedule intercomparisons with other RICs of Regions 3. Publish intercomparison report 4. Develop procedure for conducting and evaluating inter-laboratory comparison (based on general principles published in ISO standard for comparison between many laboratories)	1-3. (IOM) Reports on intercomparisons & Presentations at CIMO-2016 4a.Document describing procedure 4b. Update of CIMO Guide, incorporating procedure.	4a. July 2017 4b. Dec. 2017	M		CIMO-XV para 6.3 CIMO-16, Doc. 6, para 6.9 ET-RIC meeting report, § 3.5, 7.3 and 8.8
3.	**Strengthening RICs and supporting their communication with Members and with respective RA**	**K.Nakashima,** D.Groselj, A.Mounir, T.Holfelder, D.Prescod	1. Contact RICs without standard websites and support them in developing the information needed for their websites 2. Review outcomes of RIC evaluations and support those which have problems	1. Standard websites for all RICs 2. Evaluation of all RICs	1. July 2016 2. Dec. 2016	H		CIMO-XV para 6.3

No.	Task description	Person responsible and subteam	Action	Deliverable	Deadline for deliv.	Priority	Status [%]	Comments
			in performing such evaluations 3. On request, provide support for the evaluation of RICs 4. Prepare a template for report of RICs to the RA	3. Report on RIC audits 4. Template for RIC reporting	3. May. 2016 4. Q2 2015			
4.	**Towards calibration of ceilometer, visibilimeter and present weather sensor**	**N.Mander,** F.Montariol, D.Groselj, J.Lin	1. Identify and review existing guidance material on calibration procedure for ceilometer, visibilimeter and present weather sensor 2. Synthesize information obtained into general guidance material 3. Establish first draft of technical procedures	1. Guidance material identified 2. General guidance established on the achievement of the traceability of these instruments 3. Technical procedures drafted based on the identified materials,	1. June 2016 2. Dec. 2016 3. July 2017	M		Outcome from A.1 and A.2 and CIMO TB and TL centers Action 2 will require guidance on their traceability provided by the dedicated expert bodies Note: Outcomes of volcanic ash/aerosol intercomparison may help in progressing this task.
5.	**Implementation of the strategy for improving traceability of basic measurements (such as p, T, h) to SI**	**K.Premec,** N.Mander, D.Groselj, A.Mounir, K.Nakashima, F.Barcenas, J.Lin, D.Prescod	1. Develop outreach flyer (for decision makers) on importance of measurement traceability and how to achieve it. 2. Finalize calibration/traceability strategy 3. Ensure inclusion of the strategy in the CIMO Guide 4. Develop guidance material on how to implement traceability (for ex. use of field inspection kit)	1. Outreach flyer 2. Document with calibration strategy 3. Relevant CIMO Guide chapters updated 4. Document with guidance material published as IOM report or Annex to CIMO Guide	1. March 2015 2. Dec. 2016 3. July 2017 4. July 2017	H		CIMO-16, Doc. 6, §6.8 Perspective is for a strategy for ensuring world-wide traceability of measurements to SI.
6.	**Impact of Minamata convention and guidance for transition from mercury-based instruments to**	**A.Mounir,** N.Mander, D.Groselj, T.Holfelder, K.Premec,	1. Develop outreach flyer (for decision makers) on impact of Minamata convention 2. Collect expertise from Members having	1. Outreach flyer 2. Links to relevant publications provided on IMOP website	1. March 2015 2. Dec. 2015 3. July 2016	H		CIMO-16, Doc. 6, §6.10 CIMO-16, Doc. 6, §6.12 CIMO-16, Doc. 6, §6.13

No.	Task description	Person responsible and subteam	Action	Deliverable	Deadline for deliv.	Priority	Status [%]	Comments
	alternative technologies	D.Prescod, P. Copping	successfully transitioned away from Mercury 3. Develop road-map/guidance for transition of instruments containing mercury to alternative devices 4. Develop guidance on how to choose modern cost-effective alternative instruments (incl. list of minimum metrological characteristics of these alternatives)	3. Document with roadmap/guidance for Members wanting/having to transition away from Mercury 4. Documents with guidance on instrument selection (possibly to be included as annex to a CIMO Guide chapter) 5.	4. July 2017			CIMO-16, Doc. 6, §6.14 ET-RIC meeting report, § 8.8 Note: road-map is meant in a general manner. It is clear that Members may have different ways & timelines to implement it.
7	Assess status and need for regional standard barometer and update CIMO Guide and relevant WMO resolutions accordingly	**A.Mounir,** K.Nakashima, F.Montariol, D.Prescod, F.Barcenas	1. Collect the needs for regional standards barometers in RAs	1. Report to CIMO on the status and need for regional standard barometers	1. Dec. 2015	M		
8	**Use of modern alternatives to obsolete instruments**	**F.Barcenas,** T.Holfelder, N.Mander, A.Mounir, K.Nakashima, D.Groselj P.Copping	1. Collect information on successful experiences 2. Collaborate with HMEI in identifying alternative instruments 3. Develop guidance on how to select modern instruments replacing outdated instruments 4. Develop guidance on how to maintain and calibrate modern instruments replacing outdated instruments	1. Lists of relevant publications, and links provided on IMOP website 2. Document (possibly IOM Report) proposing alternatives 3. Guidance document and/or updates of relevant CIMO Guide chapters 4. Guidance document and/or updates of	1. July 2016 2. Dec 2016 3. July 2017 4. July 2017	H		CIMO-16, Doc. 6, §6.15 ET-RIC meeting report, § 8.10 Note: Task includes giving guidance on cost-effective AWS and liaise with ET A2.

No.	Task description	Person responsible and subteam	Action	Deliverable	Deadline for deliv.	Priority	Status [%]	Comments
				relevant CIMO Guide chapters				
9	**CIMO Guide update**	**Temperature: K.Premec,** D.Groselj, F.Montariol, T.Holfelder, K.Nakashima **Pressure: T.Holfelder,** K.Premec, F.Montariol, N.Mandel, D.Groselj	1. Fully revise and update CIMO Guide chapter on temperature and pressure	1. Updated CIMO Guide chapter	1. July 2015	H		
10	**Precipitation**	**N. Mander, A.**Mounir, D.Groselj, D.Walker	1. Review the CIMO Guide chapter on precipitation 2. Review documentation on practices on laboratory precipitation calibration	2. Propose updates of the CIMO guide	1. Dec 2017	L		Liaise with A.1 and A.2

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Workplan of the CIMO Editorial Board (2014-2018)

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
1.	**Update guidelines for the drafting updates/new editions of the CIMO Guide**	**V. Kurz**	1. Review general guidelines for authors / reviewers of CIMO Guide chapters in view of ensuring homogeneous presentation of material throughout the Guide 2. Update the guidelines to provide guidance to authors on how to indicate preferred methods to be used.	1, 2. Document with revised guidelines for posting on website			CIMO EdBd-2 para 4.6-7 CIMO-16, Doc. 6, para 6.20
2.	**Collect and review (small) modifications proposed by Members**	**K. Premec** Z. Shilenje S. Cohn A. Lilja	1. Collect proposals of revision received from Members and maintain list of outstanding issues 2. Consult with relevant ET Chairs/experts on appropriateness of proposals 3. Develop updates for relevant chapters	1. List of proposals (received by whom and when) and their status /decisions taken (when and by whom were they approved or rejected) 2-3. Revised chapters	1. Yearly 2. Yearly in March 3. Yearly in Dec.		ETs to be prompted every year. ET and external contributors of a chapter (other TC) should be prompted before each new edition/update
3.	**Review of fully revised chapters and chapters revised by ETs**	**K. Premec** With support of all (chapters will be assigned when received)	1. Review newly revised chapters on their compliance with the guidelines / homogeneity with rest of guide. 2. Liaise with authors on need for amendments	Revised chapters for consideration by Members	On-going		
4.	**Identification and planning of needed revisions**	**All**	1. In collaboration with Secretariat, develop and maintain list of chapters requiring update, revision or complete rewrite In collaboration with relevant expert teams, identify areas to be up-dated, revised or completely rewritten 2. Identify possible authors	1. List of chapters and specific issues to be addressed 2. List of chapters/ sections to be rewritten, incl. recommendations on topics to address 3. Authors contacted	Yearly brainstorming session		CIMO MG-11 para 2.5.11 (in particular Part II, Ch 5 Special Profiling Techniques for the Boundary Layer and the Troposphere) CIMO EdBd-2 para 7.1 Liaise with other TCs etc regarding need for revision of chapters dealing with

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
			3. Inform CIMO MG and Secretariat and liaise with them	4. Document advising CIMO MG of problems and possible solutions			application areas (e.g. aeronautical observations)
5.	**Contribution to the development/updates of the Manual on WIGOS, Guide to WIGOS, and WMO Technical Regulations**	**V. Kurz** K. Premec S. Cohn (ICA)	1. Follow-up and contribute to the development of the Manual on WIGOS, Guide to WIGOS and WMO Technical Regulations as required 2. Liaise with CIMO ET on required contributions 3. Compile CIMO contributions for submission to ICG-WIGOS Task Team on WIGOS Regulatory Material and CBS IPET-WIFI Subgroup on Regulatory Material, if appropriate	1. Document with CIMO contribution to Manual on WIGOS, Guide to WIGOS and WMO Technical Regulations	On-going		CIMO-16, Doc. 6 para 6.23 Note: relevant also is the WIGOS Task Team on WIGOS Metadata
6.	**Coherency between Manual on WIGOS, Guide to WIGOS, CIMO Guide and relevant ISO standards**	**V. Kurz** K. Premec S. Cohn (ICA)	1. Review proposals of ETs for ISO/WMO standards and advise ETs on how to include them into the CIMO Guide. 2. Monitor level of convergence between WMO and ISO versions of common WMO-ISO standards		On-going		CIMO-16 6.23, 7(12).7 Note: subtask 2 addresses only standards in which CIMO was involved.

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Workplan of the Theme Leader on Radiosonde Performance Monitoring (2014-2018)

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
1.	**Catalogue of radiosondes and upper-air wind systems**	A. Kats	1. Update annually the catalogue compiling global yearly statistics of BUFR, TEMP and PILOT messages and srrarasasa code figures arriving along with section 7 of TEMP messages and respective descriptors (002011,002013,002014,002003) of BUFR messages, using operational databases of the Hydrometcentre of Russia 2. Verifying abovementioned information versus WMO Publication No. 9, Volume A and drafting the list of operational upper-air stations. 3. Identifying inconsistencies (silent stations, unknown stations, invalid rara figures) in the list above and resolving them in liaison with NHMSs and compiling the Catalogue. 4. Liaising with ICG-WIGOS on facilitating migration of Radiosonde Catalogue information towards OSCAR/Surface representation	3. New version of catalogue for posting on CIMO website 4. Suggestion for catalogue migration to OSCAR/Surface	Annually 06/2015		CIMO-XV, para 5.5
2.	**Performance monitoring statistics**	A. Kats	1. Compile the quarterly upper-air performance monitoring statistics and graphical plots 2. Analyzing upper-air monitoring statistics and graphical plots, identify problems with certain	1. New version of files for posting on CIMO website 2. Report with list of identified problems	1. Annually 2. Annually		CIMO-XV, para 5.5

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
			stations/radiosonde types, and prepare a respective report				
3.	**Follow-up on identified performance issues**	A. Kats	1. Contact individual Members and HMEI on performance issues identified above 2. Identify and assist on remedy actions in respect to BUFR reporting software issues 3. Promote high-resolution native upper-air BUFR production instead of TEMP->BUFR conversion	1. Correspondence to relevant Members (e.g., NMHS) and HMEI 2. Report to CIMO-MG	1. As Req 2. Annually		CIMO-XV, para 5.5
4.	**Follow-up on coding issues**	A. Kats	1. Liaise with Members, HMEI and CBS IPET-DRMM on allocation of new entries for radiosonde/sounding system used in TDCF	1. Correspondence to relevant Members, HMEI and IPET-DRMM chair 2. Report to CIMO-MG	1. As req 2. Annually		CIMO-16, 8.9

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Workplan of the Task Team on the International Cloud Atlas (2014-2018)

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
1.	Establish sub-groups as required (text experts, image experts, decision aid) and prepare detailed plan of action	All, **Cohn, Bruhn**	1. Develop project plan 2. Continuous review.	1. Detailed Project Plan 2. Refinement of plan.	1.Sep 2014, then 2. ongoing	100 50	CIMO-16 4.35-36
2.	Identify needs for new/ replacement imagery and metadata. Generate a list of images and metadata required	Image Expert Sub-Group: **Bruhn (lead),** Anderson, Trice (may need others)	1. Review imagery 2. Prepare list of required images and metadata	1. List of the needs for new/replacements imagery and metadata	1. Oct 2014 2. Oct 2014	100 100	
3.	Draft the new Glossary	Text Expert Sub-Group - Glossary: **Lovell (lead Glossary),** Rae, Cohn (eg NSSL liaison), others	1. Prepare List 2. Add definitions	1. List 2. Glossary of terms	1. 80% Dec 2014 2. 100% Apr 2015	80 50	
4.	Review, revise and update text	Text Expert Sub-Group: **Rae (lead),** Anderson, Lovell, Cohn, need others	1. Review 3. Revise/update	2. Completed text	1. Oct 2014 2. 80% Mar 2015	100 30	
5.	Acquire and sort candidate imagery	Secretariat, **Tam,** Trice	1. Build and test web portal 2. Request submissions 3. Sort Images/Metadata	1. Test portal ready for testing. 2. Live portal built, debugged. 3. Letter to PRs etc 4. Full set of candidate images and metadata online	1. Dec 2014 2. Feb 2015 3. Feb 2015 4. 50% Apr 2015	0 0	
6.	Select Imagery	Image Expert Sub-Group	1. Select images for ICA 2. Assemble associated metadata 3. Compose descriptions/captions 4. Get second opinion on	1. Imagery Set 2. Associated metadata 3. Complete information in place for each image	1. Sep 2015 2. Nov 2015 3. Nov 2015 4. Nov 2015	0	

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
			imagery and metadata				
7.	Create an updated Cloud Coding Decision Aid and develop a simplified Cloud Classification Decision Aid (limited to identifying genera) for Volume I	Decision Aid Sub-Group: **Thurig-Jenzer (lead),** Rae, Campos, Lovell	1. Develop Decision/Coding Aid 2. Develop simplified Identification Aid	1. Updated Cloud Coding Decision Aid and Cloud 2. Classification Decision Aid	1. 80% Dec 2014 2. 80% Feb 2015	80 10	Do more cartoons need to be developed?
8.	Design all aspects of the web-based ICA, including the Image Template, all desired functionality, the final formats needed (e.g. various printable subsets), and search requirements	**Trice (lead),** Tam	1. Do it. 2. Confirm compliance with WMO website design requirements	1. Website design.	1. Sep 2015	20	Need to allow for testing and debugging here, and it may take considerable time. A review process is required.
EXTERNAL REVIEW POINT							
9.	Build the website	**Tam (lead)**, Trice	1. Do it 2. Quantify the cost of operating/maintaining the website once operational.	2. Fully functional (offline, empty) website	1. Nov 2015	0	
10.	Prepare all text, images and metadata for web format and populate the website	Secretariat		1. ICA assembled (not yet operational)	31 Dec 2015	0	
11.	Complete web site functionality	TBD		1. Fully functional website	TBD		
11a	´´Blind user´´ Test		Test every page, link and combination of button clicks	1. List of bugs			
12.	Final proof-read, error correction, and approval	TBD		1. Errors/bugs removed	TBD		
13.	Publication	TBD		ICA published on web ICA hard copy available	TBD		

Workplan of the Task Team on Competencies (2014-2018)

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
1.	**Competency sets required for IMO**	**Shandu** All	1. Review existing relevant material and examples (e.g. competencies developedby other TCs and work done by former ET-RIC) 2. Liaise with EC Panel of Experts on Education and Training to follow WMO overall approach to this topic. 3. Derive overall competency sets required to cover all functions related to instrumentation and observations	1. Documentation List 2. List of competency sets.	1. 10 Nov 2014 2. 13 Nov 2014	100 % 100 %	CIMO-XV, para 6.20 CIMO-16 6.19, 7(6).3 Four sets resulted (see Tasks 2,3,4&5)
2.	**Competencies for meteorological observations.**	**Shandu** All	1. Develop competencies for meteorological observations.	1. Document with required competencies for consideration of CIMO MG.	1. Mar 2015	90%	
3	**Competencies for instrumentation (installation, operation, maintenance)**	All: **a. Shandu** Chen **b. Chan** Angulu **c. Harper** Atilan	1. Develop draft competencies for observational instrumentation. a) HLCs 1,5 b) HLCs 3,4 c) HLCs 2 2. Finalise	1. Document with required competencies for consideration of CIMO MG.	2. Teleconf Feb 2015	30%	
4	**Competencies for instrument calibration**	**Harper** All	1. Review and revise draft competencies for instrument calibration developed by ET-RIC. 2. Finalise	Document with required competencies for consideration of CIMO MG.	2. Teleconf Feb 2015	70%	Note: Must take into account the ISO 9001 aspects of ISO17025

No.	Task description	Person responsible	Action	Deliverable	Deadline for deliv.	Status [%]	Comments
5	**Competencies for observing network and programme management**	**a. Chen** Shandu **b. Angulu** Chan **c. Atilan** Harper	1. Develop draft competencies for meteorological observations. 2. a Network Management 3. b Planning 4. c Procurement and Installation	Document with required competencies for consideration of CIMO MG.	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	1. Recommendation to CIMO MG on regulatory status of competencies. 2. Update of relevant CIMO Guide chapter or regulatory material	1. Dec 2015	0%	Note: ultimately CIMO MG will submit agreed version to WMO ETD for review.

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CIMO EXPERT TEAMS COMPOSITION (2014-2018)
(Status as of 27 November 2014)

A. OPAG IN SITU TECHNOLOGIES AND INTERCOMPARISONS

A.1 Expert Team on Operational In-Situ Technologies

Chair: Yves-Alain ROULET (Switzerland, RA VI)
Vice-Chair: Mike MOLYNEUX (UK, RA VI)

Members:

- AHMED SAAD HAMED ABDELNABY (Egypt, RA I)
- Henry Njoroge KARANJA (Kenya, RA I)
- Toshihiro HAYASHI (Japan, RA II)
- Bernd MERGARDT (Germany, RA VI)
- Olaf SCHULZE (Germany, RA VI)
- Francesco FOTI (Italy, RA VI)
- Wouter KNAP (Netherlands, RA VI)

Representatives from other Organizations:

- **HMEI:** Tero MUTTILAINEN
- **BIPM/CCT:** Andrea MERLONE

A.2 Expert Team on Developments in In-Situ Technologies

Chair: Jane WARNE (Australia, RA V)
Vice-Chair: Wiel WAUBEN (Netherlands, RA VI)

Members:

- Jianxia GUO (China, RA II)
- Yukihiro NOMURA (Japan, RA II)
- Peter LEJBJUK (Canada, RA IV)
- Neal DIPASQUALE (United States of America, RA IV)
- Ariffudin ARIFFUDIN (Indonesia, RA V)
- Andrey DUBOVETSKIY (Russian Federation, RA VI)

Representatives from other Organizations:

- **HMEI:** Jarmo HIETANEN
  Bryce FORD
  Gerhard PEVNY
- **BIPM/CCT:** Michael DE PODESTA
- **FP of Lindenberg (Germany) Lead Centre:** Franz BERGER
- **FP of Chupungnyeong (Republic of Korea) Lead Centre:** Heejin IN

A.3 Expert Team on Instrument Intercomparisons

Chair: Emanuele VUERICH (Italy, RA VI)
Vice-Chair: Rodica NITU (Canada, RA IV)

Members:

- Yatian GUO (China, RA II)
- Budi SANTOSO (Indonesia, RA V)
- Marijn DE HAIJ (Netherlands, RA VI)
- Wolfgang FINSTERLE (Switzerland, RA VI)
- Rolf PHILIPPONA (Switzerland, RA VI)
- Florence BESSON (France, RA VI)

Representatives from other Organizations:

- **HMEI:** Aki LILJA
- **BIPM/CCT:** Carmen GARCIA IZQUIERDO
- **FP of Sodankylä (Finland) Testbed:** Osmo AULAMO
- **FP of Boseong (Republic of Korea) Testbed**: Heejin IN

A.4 Expert Team on Aircraft-Based Observations

Chair: Stewart TAYLOR (United Kingdom, RA VI)
Vice-Chair: Douglas BODY (Australia, RA V)

Members:

- Domnick ARODI (Kenya, RA I)
- Jianliang XU (China, RA II)
- Gregory MEYMARIS (United States of America, RA IV)
- Axel HOFF (Germany, RA VI)
- Siebren DE HAAN (The Netherlands, RA VI)

Representatives from other Organizations:

- **HMEI:** Bryce FORD

A.5 Task Team on Radiation References

Chair: Bruce FORGAN (Australia, RA V)
Vice-Chair: Julian GRÖBNER (Switzerland, RA VI)

Members:

- Nozomu OHKAWARA (Japan, RA II)
- Wolfgang FINSTERLE (Switzerland, RA VI)
- Anatoly TSVETKOV (Russian Federation, RA VI) - WRDC Representative

Representatives from other Organizations:

- **BIPM/CCPR:** Nigel FOX
- **BIPM/CCT:** Christian MONTE

B. OPAG REMOTE-SENSING TECHNOLOGIES

B.1 Expert Team on Operational Remote-Sensing Technologies

Chair: Volker LEHMANN (Germany, RA VI)
Vice-Chair: Reinout BOERS (Netherlands, RA VI) email sent

Members:

- Pascal Felix WANIHA (United Republic of Tanzania , RA I)
- Chong PEI (China, RA II)
- Naoki TSUKAMOTO (Japan, RA II)
- Wai KONG (Hong Kong, RA II)
- Richard ICE (United States of America, RA IV)
- Paul HETTRICK (Australia, RA V)
- Thomas KANE (Australia, RA V) Representative
- Bernard URBAN (France, RA VI)
- Hidde LEIJNSE (Netherlands, RA VI)
- Oguzhan SIRECI (Turkey, RA VI)

Representatives from other Organizations:

- **HMEI:** Pekka UTELA
  Jens DIDSZUN

B.2 Expert Team on New Remote-Sensing Technologies

Chair: Lidia CUCURULL (United States, RA IV)
Vice-Chair: Arnoud APITULEY (Netherlands, RA VI)

Members:

- Pak Wai CHAN (Other, RA II)
- Tetsu SAKAI (Japan, RA II)
- Pablo RISTORI (Argentina, RA III)
- Matthew TULLY (Australia, RA V)
- Siebren DE HAAN (Netherlands, RA VI)
- David DONOVAN (Netherlands, RA VI)

Representatives from other Organizations:

- **HMEI:** Reijo ROININEN
  Rémy PEPIN
  Jens DIDSZUN
  Stephane VICTORI
- **FP of Lindenberg (Germany) Testbed:** Franz BERGER
- **FP of Payerne (Switzerland) Testbed:** Dominique RUFFIEUX
- **FP of Izana (Spain) Testbed:** Emilio CUEVAS
- **FP of Hohenpeissenberg (Germany) Testbed:** Chrisian PLASS-DUELMER

B.3 Theme Leaders on Radio-Frequency Protection

- David FRANC (United States, RA IV)
- Oguzhan SIRECI (Turkey, RA VI)

C. OPAG CAPACITY DEVELOPMENT AND OPERATIONAL METROLOGY

C.1 Expert Team on Operational Metrology

Chair: Drago GROSELJ (Slovenia, RA VI)
Vice-Chair: Tilman HOLFELDER (Germany, RA VI)

Members:

- Mounir AZIZ (Morocco, RA I)
- Kouichi NAKASHIMA (Japan, RA II)
- Damien PRESCOD (Bahamas, RA IV)
- David WALKER (United States, RA IV)
- Ferdinand BARCENAS (Philippines, RA V)
- Francoise MONTARIOL (France, RA VI)
- Neil Dennis MANDER (UK, RA VI)
- Krunoslav PREMEC (Croatia, RA VI)

Representatives from other Organizations:

- **HMEI:** Paul COPPING
  Jing LIN
- **BIPM/CCT:** Michael DE PODESTA
- **FP of Lead Centre on Precipitation Intensity (Italy):** Emanuele VUERICH

C.2 CIMO Editorial Board

Chair: Volker KURZ (Germany, RA VI)
Vice-Chair: Krunoslav PREMEC (Croatia, RA VI)

Members:

- Stephen COHN (United States of America, RA IV)
- Zablon Weku SHILENJE (Kenya, RA I)

Representatives from other Organizations:

- **HMEI:** Aki LILJA

C.3 Theme Leader on Radiosonde Performance Monitoring

Alexander KATS (Russian Federation)

C.4 Task Team on the International Cloud Atlas

Chair: Stephen COHN (United States, RA IV)
Vice-Chair: Michael BRUHN (Co-Chair) (Australia, RA V)

Members:

- George ANDERSON (UK, RA VI)
- Marinés CAMPOS (Argentina, RA III)
- Ernest LOVELL (Barbados, RA III)
- Colleen RAE (South Africa, RA I)
- Kwong Hung TAM (Hong Kong, RA II)
- Eliane THURIG-JENZER (Switzerland, RA VI)
- Jim TRICE (UK, RA VI)

C.5 Task Team on Competencies

Chair: Bhule SHANDU (South Africa, RA I)
Vice-Chair: Ying Wa CHAN (Hong Kong, China, RA II)

Members:

- Humphrey Geoffrey ANGULU (Kenya, RA I)
- Yongqing CHEN (China, RA II)
- Andrew HARPER (New Zealand, RA V)
- Mustafa ATILAN (Turkey, RA VI)

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TENTATIVE PLAN FOR CIMO ACTIVITIES (2014-2018)

	MILESTONE PLAN OF CIMO ACTIVITIES		2014		2015				2016				2017				2018			
					Quarter				Quarter				Quarter				Quarter			
			3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
A.	**OPAG Standardization and Intercomparisons**																			
1	ET on Operational In-Situ Technologies	M											**M**							
2	ET on Developments in In-Situ Technologies	M													**M**					
3	ET on Instrument Intercomparisons	M																		
4	ET on Aircraft Measurements						**M**									**M**				
4	TT on Radiation References						**M**													
B	**OPAG Remote-Sensing and New Technologies**																			
1	ET on Operational Remote-Sensing Technologies	M						**M**												
2	ET on New Remote-Sensing Technologies	M								**M**										
3	TL on Radio-Frequency Protection																			
C	**OPAG Capacity Building**																			
1	ET Operational Metrology	M						**M**							**M**					
2	CIMO Guide Editorial Board	M							**M**							**m**				
3	Theme Leader on Radiosonde Performance Monitoring																			
4	Task Team on the International Cloud Atlas			**M**				**M**												
5	Task Team on Competencies			**M**																
	Training and Capacity Building Events																			
1	Workshop on challenges with mountain observations (in collab. with RA VI)	W							**W**											
2	Training Workshop on Metrology for RA III	W						**W**								**W**				
3	TECO	C										**C**								**C**
	Intercomparisons																			
1	IOC on Solid Precipitation Intercomparison	M				**M**		**M**		**M**										
2	Solid Precipitation Intercomparison	I	**I**	**I**	**I**	**I**	**I**													
3	IOC on Radar Algorithm Intercomparison	M									M									
4	Radar Algorithm Intercomparison	I	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**	**I**									
5	IOC on Upper-Air Instruments Intercomparisons	M								**M**				**M**						
6	Upper-Air Intercomparison	I									**I**	**I**								

7	IOC on Lidar/Ceilometer	M																				**M**
8	Upper-Air Intercomparison	I											**I**	**I**	**I**	**I**						
9	Regional Pyrheliometer Intercomparison	I																				
10	IPC-XII (2015)	I					**I**															
	Other Meetings																					
1	CIMO-MG Meeting	M		**M**								**M**						**M**				
2	CIMO-XVII Session	S																				**S**
	Total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total				0				0				0				0					

= done or already committed

= planned and funded under P&B 2015-2018

= planned but not funded

= funded under ETR Programme

C = Conference

I = Intercompar.

M = Meeting

S = Session

W = Workshop

= **Planned and not fully funded**

CIMO CERTIFICATE SCHEME

Award for Outstanding Services to WMO and in Particular to CIMO

An award to be made for an extraordinary and ongoing contribution to CIMO over many years.

Has WMO involvement spanning at least 12 years of dedication and accomplishments that are above and beyond the everyday and have made a great and lasting contribution to IMO and WMO programs.

Has worked consistently and steadfastly with noteworthy/pioneering contributions to the advancement of WMO and IMO at an International level.

Has provided exemplary leadership, professionalism, personal integrity, and inspiration that have been a motivational model for the growth of others within CIMO.

Excellence in outreach and building awareness of CIMO roles and programs within WMO and society.

Notes:

- Retired candidates are accepted.
- The award may be given posthumously.
- This award would be likely to be made very rarely.

Award for an Extraordinary Contribution to CIMO

An award to be made for an extraordinary contribution to CIMO.

Long-standing (normally at least 8 years) distinguished, dedicated and outstanding contributions to CIMO that have shaped the development and reputation of IMO.

Accomplishments must be significant, widely recognized as such, and of positive and lasting quality.

Must be a recognised leading expert and have demonstrated professionalism and a passion that is a model for others.

Notes:

- Alive and active professionally in the IMO at the time of nomination.
- It is likely that only a few of this award would be made per CIMO Session.

Award for a Significant Contribution to CIMO

An award to be made for a significant contribution to CIMO during an inter-sessional period.

The awardee will have been energetic, proactive and conspicuous in performing their own work and advancing the work of their team or theme.

Examples might include those who have:

- been lead or significant team members or Theme Leaders;
- lead or significant contributing authors;
- been active in organising conferences and symposia;
- led or significantly contributed to capacity building events.

Notes:

- Alive and active professionally in the IMO at the time of nomination.
- It is likely that the majority of CIMO Expert Team or Task Team members and Theme Leaders would receive this award each CIMO Session.

Nomination and Award Process

General:

All candidates for awards are to be nominated at least two weeks prior to the last CIMO MG session preceding a CIMO session (generally four to six months prior to the CIMO session).

All awards will normally be presented in conjunction with the CIMO session.

Awards in any category will not be made if there are no nominees or if none of the nominees is suitable.

Award Nomination:

All candidates for awards are to be nominated by:

- the President or Vice President of CIMO, for nomination of a current Management Group member;
- the respective OPAG Chair, or an appropriate CIMO MG member, for nomination of others.

Nominations for an Award for **Outstanding Services** to WMO and in Particular to CIMO and for an Award for an **Extraordinary Contribution** to CIMO will include the reason for such a nomination and suggested text to be included on the certificate, using a template form available for this purpose.

All nominations are to be reviewed and endorsed by the CIMO MG.

Award Selection:

Awards for **Outstanding Services** to WMO and in Particular to CIMO are to be approved by the Secretary General of WMO, based on the recommendation of the CIMO MG. The certificate is to be co-signed by the President of CIMO and the Secretary General of WMO.

Selection of successful candidates for other awards (Awards for an **Extraordinary or Significant** Contribution to CIMO) is to be made by the CIMO Management Group. The certificates for these awards will be co-signed by the President of CIMO and the WMO Director of the Observation and Information Systems Department.

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ACTION LIST
CIMO-MG-13, Offenbach, Germany, 7-9 December 2014

Status:

Action Nb	Para. of Fin. Report	Action required	Responsible	Deadline	Status/remarks
1	3.1.2	Organize teleconference with A1 to finalize structure and expected content of Guidelines on migration from manual to automated observations.	J. v. der Meulen	March 2015	
2	3.1.7	Identify experts from University of Wisconsin to contribute to tasks relevant to polar observations	M. Ondras (Secretariat)	March 2015	
3	3.1.10	Invite selected experts to part of the Task Team on Upper-air In-situ and Remote-sensing Measurements Intercomparison	Secretariat	March 2015	
4	3.1.12	Re-submit proposal for composition of the Task Team and Volcanic-Ash Intercomparison for approval by CIMO MG.	B. Hartley	June 2015	
5	3.3.1	Regularly inform CIMO MG on status of revision/changes to the Guide on Uncertainty in Measurements	LI Bai	Yearly, June	
6	3.3.2	Liaise with own NMHS to consider providing an intercomparison kit for RIC inter-laboratory comparisons	All MG members	June 2015	
7	3.3.8	Modify 2014 Edition of the CIMO Guide available on the website according to guidance provided by CIMO MG	Secretariat	March 2015	
8	3.3.12	Approach Permanent Representatives that could be hosting the website of the International Cloud Atlas	B. Calpini and W. Zhang	Cg-17: May/June 2015	
9	3.3.16	Have CIMO competencies reviewed by WMO Education and Training Programme	Secretariat	Dec. 2015	

Action Nb	Para. of Fin. Report	Action required	Responsible	Deadline	Status/remarks
10	4.3	Represent CIMO at the meetin of the Intercommission Task Team on Land Transport	B. Calpini	28 January 2015	
11	4.5.2	Get 6-monthly reports (updated workplans) from the ETs/TTs/TLs they are overseeing. Inform president and Secretariat of situation.	All MG members	6-monthly on end of march and end of September	
12	4.5.2	Request reports from CIMO Testbeds and Lead Centres and provide to relevant CIMO ETs and TTs assessing Testbeds and Lead Centres	Secretariat	March 2016 March 2018	
13	4.6.6	Approach ISO toward updating ISO TC180 standards as common ISO-WMO standards and developing common standards with ISO TC146/SC5	Secretariat	June 2015	
14	4.6.7	Develop update for Resolution of WMO Executive Council on the process for the development of common WMO-ISO standards and inform Executive Council on proposal of CIMO to collaborate with ISO on the development of a number of common WMO-ISO standards	Secretariat	April 2015	
15	4.7.3	Circulate HMEI tender documentation template to CIMO MG for review once sufficient progress will have been made	Secretariat	TBD	
16	5.3	Send proposal for modifications of the Guidelines for the Granting of the Prof. Vilho Väisälä awards to the president and Secretariat	All MG members	March 2015	
17	5.3	Prepare a proposal for modifications of the Guidelines for the Granting of the Prof. Vilho Väisälä awards and submit it for approval to the WMO Executive Council	B. Calpini and Secretariat	April 2015	
18	5.4	Finalize criteria for granting of CIMO certificates	Secretariat	January 2015	

Action Nb	Para. of Fin. Report	Action required	Responsible	Deadline	Status/remarks
		based on CIMO MG discussion			
19	5.6	Develop a form for the proposal of nominations for the two higher-lever certificate types.	B. Hartley	Sept. 2016 (MG-14)	
20	5.7	Finalize and authorize list of CIMO experts that should receive a certificate for the period 2010-2014	B. Calpini	January 2015	
21	6.1	Send Cg-17 CIMO President report and IMOP document for review to the president	Secretariat	January 2015	
22	6.2	Organize side-meeting on International Cloud Atlas and update of the CIMO Guide during Cg-17	B. Calpini and Secretariat	May 2015	
23	6.3	Support CIMO ETs in preparing outreach flyers (importance of traceability, impact of Minamata) to be distributed during Cg-17	Secretariat	Jan-April 2015	
24	7.2	Propose response/position on the recommendations submitted by the CIMO/WIGOS Exploratory Workshop for approval by CIMO MG.	B. Calpini, B. Forgan, E. Büyükbas and Secretariat	March 2015	
25	7.6	Develop CIMO position paper on the pros and cons of both solutions (k=1 and k=2) in WMO documents and OSCAR	J. van der Meulen and B. Forgan	February 2015	
26	7.6	Approach CBS IPET-OSD develop CBS IPET-OSDE position paper on the pros and cons of both solutions (k=1 and k=2) in WMO documents and OSCAR and to convene a teleconference to address this issue prior to ICG-WIGOS-4 (Feb. 2015)	Secretariat	February 2015	

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