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| **World Meteorological Organization****Commission for Instruments and Methods of Observation** **CIMO Management Group****Fifteenth Session**Geneva, Switzerland, 26– 29 March 2018 | **CIMO/MG-15/Doc. 2.2(1)** |
| Submitted by:J.P. van der Meulen23.03.2018 |

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# Report on progress, recommendations and future activities of Expert team ON OPERATIONAL IN-SITU TECHNOLOGIES, ET-OIST, (A1)

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| **Summary and purpose of document**This document provides information on the activity of the CIMO Expert Team on Operational In-Situ Technologies, and in particular the status of work for the different tasks included in the workplan of the ET-OIST, as defined and agreed by the MG. |

**Action proposed**

 The Meeting is invited to …

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**Appendices:** I [Updated Workplan](#Appendix1)

 II [Topics and deliverables for after CIMO-17](#Appendix2)

**EXECUTIVE SUMMARY**

In total 10 tasks were started, each with its responsible person and priority (see attached workplan). Priority number 1 tasks are:

* "Further develop and finalize guidelines on migration from manual to automated observations", "Siting classification", "Sustained performance classification for observing stations on land", "Standard for the classification of instruments for rainfall intensity measurements" and " Update of CIMO Guide following publication of Ghardaia intercomparison report"

Clearly, focus is on the evaluation and further development of several type of classifications in view of standardization and on recommended practices or improvement of guidance material.

Apart from a number of teleconferences, the expert team met jointly with the ET-DIST on 21-23 June 2017. Such a joint meeting has the advantage to mutually co-operate, in particular on items with an overlapping nature.

As input for this meeting a number documents were supplied, which can be regarded as draft versions for the deliverables, indicated in the workplan. An examples of such a draft are is:

* Guidelines On Combining Information From Composite Observing Systems

Of interest are the experiences by the Members with the siting classification scheme. In particular with respect to temperature measurement in countries near the polar regions, where the elevation of the daily sun is low, especially during wintertime. A detailed report is provided by the Scandinavian countries in Europe. Based on these experiences a further update is encouraged, with attention for additional guidance material on how to use the siting classification adequately. A workshop was proposed to be organized to finalize the suggested modifications.

On the issue related to the transition of manual to automated observations it is concluded that although the availability of guidance material is sufficient, the lack of knowledge, experience and skillness of personel (at all levels) is the major bottelneck. Typically the complexity related to the introduction of new, modern equipment, digital data communication and processing and network related data management is underestimated. Based on further investigations on the users' critical problems a training course should be developed to train NMHS personnel at various levels (management included) to learn how to establish and operate AWS networks. Within such a course a great variety of issues will be considered, not only the technical aspects. To improve the guidance material, the AWS chapter in the CIMO was reviewed resulting in a substantial amount of suggested modification.

At present a new classification scheme is under development, entitled:

* Classification of initial and ongoing surface measurement quality

In this scheme four classes (A to D) are defined based on maintenance, quality control, calibration and target uncertainty. The current status is a final draft version of 9 pages.

**REPORT ON ACHIEVEMENTS, RECOMMENDATIONS AND FUTURE ACTIVITIES OF CIMO EXPERT TEAM ON OPERATIONAL IN-SITU TECHNOLOGIES, ET-OIST, (A1)**

*[based on information, proved by the ET chair ]*

1. ***Major achievements with respect to Workplan***
	1. Draft IOM report "Guidelines on combining information from composite observing systems" prepared.
	2. Evaluation of implementation of the siting classification scheme resulted in a proposal to improve this scheme.
	3. New classification scheme proposed to classify stations by variable based on maintenance, quality control, calibration and target uncertainty
	4. In finding solution to support the transition of manual to automation it is concluded that focus should be on extensive training of NMHS personnel that has any relationship with this transition, at all levels, not only technology related.
	5. In support of further improvement and update of the CIMO Guide: A major revision of the AWS chapter is proposed.
2. ***Problems encountered***
	1. No specific problems encounterd
3. ***Recommendations***
	1. To update the current siting classification scheme based on reported experiences
	2. To adopt the new classification scheme related to maintenance
	3. To start up an activity resulting in a training course for NMHS personnel to facilitate the transition from manned to automatic observations.
4. ***Major topics for future work with expected associated deliverables***
	1. Improvement and introduction of classification schemes, with appropriate detiled guidelines on how to implement these schemes
	2. Further research and development on best practices to train NHMS personnel on the transition from manned to automated observations.

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**APPENDIX I**

**UPDATED WORKPLAN**

**Workplan of the Expert Team on Operational In-Situ Technologies (2014-2018)**(Version: Updated for the CIMO MG Meeting, 26-29.03.2018)

| **No.** | **Task description** | **Priority[[1]](#footnote-1)** | **Person responsible** | **Action** | **Deliverable** | **Deadline for deliv.** | **Status****[%]** | **Comments** |
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| 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 precipitation gauge data in support of weather radar quality control.
3. Develop guidance material on the integration of surface-based in-situ, surface-based remote sensing, and space based technologies to provide composite information with added-value.
 | 1&2. IOM Report or other document type if appropriate (CIMO Guide update, document for meeting or for AWS Portal, etc.)3.End of intersessional period (2018) | 1&2. Draft report for 31.12.2015, final report for 31.12.2017 (harmonization with deadlines ET-ORS)3.End of intersessional period (2018) | 1. 75
2. 75
3. 0
 | Draft report was made by T. Hayashi (31.12.2015) and was reviewed by ET-OIST.CIMO MG-11CIMO-16 §4.9, 4.10(in collaboration with ET-ORS)Request from OSCAR🡪 what type of request (Yves-Alain to clarify with JörgKlausen)🡪 No request so farDraft report submitted to the MG early 2016 (MG meeting in Offenbach 5-8 April), no feedback yet (Kruno will investigate)New version will be prepared by Toshihiro until early June, working document for the A1/A2 joint meeting in Geneva (21-23.6.2017)CIMO Guide update 🡪 submit a proposal to MG by November 2017 at the latestDeliverable 2: Ongoing project at MeteoSwiss (follow-up SPICE and know-how transfer to radar community), which could be used for this task.During the A1/A2 joint meeting in June 2017, it has been decided that the document prepared by T. Hayashi and JMA will be finalized and published as an IOM Report. Deadline: 2nd half of 2018.See draft document attached. |
| 2. | **Further develop and finalize guidelines on migration from manual to automated observations** | **1** | **Mike Molyneux**Bernd MergardtAhmed SaadHenry 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~~

Share the draft of training courseReplace the task by “CIMO will actively promote the organization and support of a training course”Review/refine the training course during joint meeting in June | 1. ~~Teleconference~~
2. ~~IOM Report~~
3. ~~Updates to CIMO Guide~~

1 | ~~1. March 2015~~~~2. 31.12. 2015~~~~2. 31.12. 2016~~ | 50 | Now part of a larger activity under WIGOS: Development of an AWS Handbook. WMO project that goes beyond technical question: capacity building, procurement guidance, preparation of the person to manage the process properly.Climatology involved?Link with Meteomet: A. Merlone to provide input docs on measurement uncertainty of AWS and impact of transition on data, for workshop in GenevaCIMO-16 §4.12, CBS/OPAG-IOS (ET-AWS-6)/Doc. 7(1), (7.7.2010), submitted by Mike MolyneuxCapture output from WIGOS AWS workshopsInform C1 - Task on Minamata and mercury.A draft for a training course has been prepared by M. Molyneux, and discussed during the A1/A2 joint meeting in June 2018. The document has also been presented during the AWS Conference (Offenbach Oct. 2018).See documents attached. |
| 3. | **Siting classification** | 1 | **Yves-Alain Roulet**Olaf SchulzeToshihiro HayashiAndrea Merlone | 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 learned on how to implement the classification, including benefit achieved with it.
3. Maintain liaison with ISO re maintenance of WMO/ISO standard

New actions defined (see Comments), which will extend to the next intersession period. | 1,3Updated classification if required2 IOM Report with contribution from Norway, Austria, Switzerland, Japan, UK, Hong Kong, Germany,…(tbd)Reports from members for discussion during June meetingNordobs Report published, will not be published as an IOM report (copyright issues), but we be referenced on WMO classification webpage | 1. 31.12.20172. 31.12.20173. Ongoing | 1. 75%2. 50%3. Ongoing | Link with Meteomet2 activity: Measurement protocol for evaluation of siting uncertainty for temp measurements (review from ET-OIST to A. Merlone).Support to the METEOET siting experiment.Link with metrology well established through regular exchange with A. Merlone.Y.-A. Roulet member of the Metrology for Meteorology and Climate" Conference MMC-2016 scientific committee.CIMO-16 §4.3, 4.4, 4.6, 4.7To be integrated into OSCARErcan BUYUKBAS (B2, B3)A. Merlone to liaise with relevant Meteomet2 actions.ET-OIST in charge of the implementation and supervision (?)This subject has been discussed during the A1/A2 joint meeting (June 2017), and it was agreed that additional work is needed before an update of this Annex in the CIMO Guide can be done, or additional guidance material can be finalized. Need first to collect questions and concerns from the Members, and to organize a workshop to sort this out and develop some proposals. |
| 4. | **Sustained performance classification for observing stations on land** | 1 | **OlafSchulze**Francesco FotiAhmed SaadHenry Karanja | 1. Finalize the development of the classification
2. Develop guidance material on how to apply the classification
 | 1. New WMO standard2. Updated CIMO Guide | 1. 30.06.20172. 31.12.2017 | 1. 1002. 100 | ET members should consider whether to split this classification into components: e.g, instrument, maintenance regime, calibration regime. 🡪 further discussion neededCIMO-16 §4.3To be integrated into OSCAR🡪 Propose classification 🡪 CR to OSCAR for new metadata fieldsSee minutes last ET-Standardization meeting (26.6.2014)Yves-Alain Roulet to first clarify with M. LeroyET-OIST in charge of the implementation and supervision (?)The document has been finalized and submitted to CIMO Guide EB in March 2018 (see attached). |
| 5. | **Metadata standards**  | 2 | **Yves-Alain Roulet**Olaf SchulzeAhmed 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-WMD2. Expanded metadata standard (if appropriate) | Ongoing |  | CIMO-16 §4.2Link 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)No update, no activities needed so far. |
| 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

Yves-Alain will ask HenryKruno will investigate at CHy | 1. Draft standard
2. Progr. Contact & focal points nominated
3. Updated standard
4. Final draft standard submitted for approval by CIMO
 | 1-31.12.20174-30.06.2017 | 50% | Deadlines need to be revised (schedule might be too tight)CIMO-16 §4.5Note: Liaise with assigned CIMO Testbeds and Lead CentresFormalize link with CHy:via SecretariatCIMO-16 §7.60Meeting CHy/CIMO in October 2017: there is an ongoing activity within CEN, CHy has interest in this standard. Little interest and importance from NMHS’s, since the 1 min rainfall intensity is generally not retrieved as a standard parameter (e.g. at MeteoSwiss). If a standard is developed, it shouldn’t go against the WMO memebers interests. If there is a working group active, WMO should participate. |
| 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 §4.8Liaise with TT-Radiation ReferenceNo expectation for the moment |
| 8. | **Update of CIMO Guide following publication of Ghardaiaintercomparison report** | 1 | **Mike Molyneux**Bernd Mergardt | 1. Contact M. Leroy
2. Develop an update for relevant CIMO Guide chapters on recommended standard calibration procedures, etc. according to results of intercomparison
 | 1. Advice if update of CIMO Guide is required 1.2 Updated CIMO Guide chapter \* | 1-30.06.20162-30.06.2017 |  | Contact M. Leroy to find out what still needs to be doneSeek some support from M. Leroy, first to find out whether the report could be used for CIMO Guide update, and how to move onUpdate from DWD (current test on shelters) |
| 9. | **Guidance on Wind Measurement and Reporting** | 2 | **TBD**(Jitze van der Meulena.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 | 1. 100% | 3 recommendations from CIMO-16 §4.38-4.41BUFR vs CIMO Guide 🡪 consistency neededToshihiro to contact Hong Kong Obs and ask to give detail information on the concern🡪 Done, the topic will be discussed during A1/A2 meeting in June 2017, and an answer will be providedSubject discussed and solved with Hong Kong Observatory during A1/A2 joint meeting (June 2017). See document attached. |
| 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 COST ES1404 into CIMO Guide.
3. Develop proposal for required follow-up activities 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
 |  | Y.-A. Roulet took part to thekickoff meeting, which took place in Grenoble (18-19.3.2015). 🡪Minutes pending.Cost action ES1404No action needed so far. Link with WMO is ensured via Y.-A. Roulet (member of the Swiss delegation in HarmoSnow) and GCW. |

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**APPENDIX II**

**APPENDIX III: Draft workplan for after CIMO-17**(Note: do not fill in colums Person Responsible/Deadline/Status)

| **No.** | **Task description** | **Person responsible** | **Action** | **Deliverable** | **Deadline for deliv.** | **Status****[%]** | **Comments** |
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| 1. | **Update Siting Classification Scheme** |  |  |  |  |  |  |
| 2. | **Guidance on the implementation of classification schemes** |  |  |  |  |  |  |
| 3. | **Establish a Manned to Automated Observation Course** |  |  |  |  |  |  |
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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 [↑](#footnote-ref-1)