

WORLD METEOROLOGICAL ORGANIZATION
COMMISSION FOR BASIC SYSTEMS
OPEN PROGRAMME AREA GROUP ON INTEGRATED OBSERVING SYSTEMS
INTER PROGRAMME EXPERT TEAM ON WIGOS FRAMEWORK
IMPLEMENTATION (IPET-WIFI)
(Third Session)

Exeter, United Kingdom

1 – 4 September 2015

FINAL REPORT



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GENERAL SUMMARY

1. ORGANIZATION OF THE SESSION

Opening of the session

1.1 The Third Session of the CBS OPAG IOS Inter Programme Expert Team on WIGOS Framework Implementation (IPET-WIFI) was conducted in Exeter, United Kingdom from 1 to 4 September 2015, at the kind invitation of Mr Robert Varley, Permanent Representative of the United Kingdom of Great Britain and Northern Ireland with WMO. The meeting was opened by Dr Jochen Dibbern, Chairman of IPET-WIFI. Dr Dibbern welcomed the participants (listed at Annex I). He noted that IPET-WIFI is a small group, but has been highly productive. He noted that much has happened since its first session, when there was much uncertainty about what WIGOS implementation would involve. He expressed his sincere thanks to the UK MetOffice for hosting the meeting. Dr Dibbern then invited Dr Wenjian Zhang, Director of the Observations and Information Systems Department of WMO, to address the session.

1.2 Dr. Zhang welcomed the participants on behalf of the Secretary General of WMO and gave thanks to the MetOffice for hosting the meeting, noting the excellent facilities available for the meeting. He highlighted two things. The first of these was the success of WIGOS at the Seventeenth World Meteorological Congress (Cg-17). Cg-17 had approved the key WIGOS documents, which included the new Section of the WMO Technical Regulations on WIGOS, the WIGOS Manual, and the latest edition of the Manual on the GOS, updated to reflect the advent of the WIGOS Manual. He noted that there had, in addition, been several successful side events on WIGOS. He noted that together these things demonstrated the achievement of member recognition of WIGOS during past 4 years and that the leadership of Dr Dibbern as Chair of CBS OPAG-IOS and a member of ICG-WIGOS had been a key to this success. He also commended the efforts of IPET-WIFI, particularly in regard to its participation in the preparation of the WIGOS regulatory material, the WIGOS core metadata standard, and the WIGOS Data Quality Monitoring System.

1.3 Dr Zhang's second point was forward-looking. He noted that Cg-17 has approved the 4 year pre-operational phase of WIGOS. This would be carried out at the project level, the key need being the provision of WMO secretariat support to enable Members to implement WIGOS nationally. This is a unique opportunity. Regarding IPET-WIFI, it would need to determine the critical mechanisms and technical material that Members need for national WIGOS implementation. It would also need to contribute to regional WIGOS implementation. How could it create a challenging and competitive environment to motivate members? Will WMO be able to mobilize more resources to assist by establishing regional WIGOS centres? Dr Zhang urged the session to include strategic level discussion of these issues. In closing, Dr Zhang offered the assistance of the WMO secretariat to answer any questions that might arise during the session.

1.4 Dr Dibbern next invited Mr Simon Gilbert to speak on behalf of the session hosts, the UK Met Office. Mr Gilbert welcomed the participants to UKMO and urged them to make the most of their visit, noting that he would be on hand to assist in organizing meetings with key UKMO experts. Mr Gilbert wished the participants a successful meeting.

1.5 Dr Dibbern invited the members around the table to introduce themselves then obtained an update from the WMO Secretariat on:

- members who could not attend or would attend by Webex this week, and
- changes in membership since the last meeting.

Adoption of the agenda

1.6 The Session adopted the Agenda for the meeting.

Working arrangements

1.7 The tentative working hours for the meeting were agreed upon.

2. REPORT OF THE CHAIRMAN

2.1 Dr Dibbern reported on some of the major activities undertaken since the second meeting of the IPET-WIFI. He noted that the Terms of Reference had been updated by CBS Ext(2014) and a fourth Sub-group had been activated subsequently to review, coordinate and advise on the content of the surface-based part of OSCAR. He reminded the session that the work of IPET-WIFI comprises provision of technical advice, guidance, practices and procedures for WIGOS Framework Implementation by provision of detailed GOS-related input to ICG-WIGOS in specific areas of the WIGOS framework implementation plan, these being (i) WIGOS Regulatory Material, (ii) WIGOS Meta Data, (iii) WIGOS Quality Management, (iv) collaboration with CIMO on development of guidance for WIGOS standards and best practices, (v) WIGOS Information Resource (WIR), and (vi) capacity development, education and outreach strategy.

2.2 As Chair of IPET-WIFI, Dr Dibbern had participated in a number of WMO meetings relevant to IPET-WIFI since IPET-WIFI-2. He noted that these included CBS-Ext (2014), ICG-WIGOS 4, Cg-17 and EC-67, but noted that the outcomes of these meetings would be covered under agenda item 4. He noted the close link between the ICG-WIGOS task teams and IPET-WIFI sub-groups: with Russell Stringer leading ICG-WIGOS TT-WRM as well as IPET-WIFI SG-RM, Karl Monnik leading IPET-WIFI SG-MD while also a member of ICG-WIGOS TT-WMD, and Kevin Schrab, Chair of IPET-WIFI SG-QM having assisted ICG-WIGOS TT-WQM. He noted that the progress of these teams would be presented separately under agenda items 5, 7 and 8.

2.3 CBS-Ext (2014) had appreciated the progress made in the development of the WIGOS Information Resource (WIR), and noted that the Observing System Capability Analysis and Review Tool (OSCAR) in particular has gained substantial attention and visibility among the WMO Members. The operational hosting of OSCAR will be migrated from the WMO Secretariat to MeteoSwiss and responsibilities within CBS for overseeing and reviewing of OSCAR lie within OPAG-IOS, with the overall coordination and leadership in IPET-WIFI. The Commission had approved the revised Terms of Reference of IPET-WIFI, including establishment of an additional IPET-WIFI Sub-group on OSCAR Development (SG-OD). Simon Gilbert (UK Met Office) had been nominated Chair and the first meeting of the SG had been held in Offenbach, Germany, 6-8 July 2015.

2.4 Dr Dibbern noted that the results presented to Cg-17 were a milestone in completing most critical activities of the WIGOS Framework Implementation. The WMO Congress approved the WMO Technical Regulations (WMO-No. 49), Volume I, Part I – WIGOS and its Annex - Manual on WIGOS as well as the revised Manual on the GOS. In addition Cg-17 decided that the development of WIGOS will continue into a Pre-operational Phase in the seventeenth financial period with the aim of having Members benefit from a fully operational WIGOS from 2020 onward. The WIGOS Pre-Operational Phase will focus on: (i) complementing the WIGOS Regulatory Material with necessary guidance material providing Members with those technical details that are required for the implementation; (ii) further developing the WIGOS Information Resource (WIR), with special emphasis on the operational deployment of the OSCAR/Surface database; (iii)

development and implementation of the WIGOS Data Quality Monitoring System; (iv) concept development and initial establishment of Regional WIGOS Centres; and (v) national WIGOS implementation.

2.5 Chair IPET-WIFI participated in the CIMO-WIGOS Exploratory Workshop: Improving Surface-based Data Quality through Improved Standardization of Procedures, which was held at the Deutscher Wetterdienst's Meteorological Training and Conference Centre (BTZ) at Langen, Germany from 3 to 5 December 2014. The main objectives of the workshop were: (i) to explore mechanisms for improving the quality of surface-based observations through standardization of calibration, maintenance, and operational (algorithms, etc.) procedures, as a WIGOS Standardization initiative; and (ii) to explore mechanisms for ensuring optimal communication of such standardized procedures to Members, as a WIGOS Capacity Development initiative. The outcome of the workshop were 11 recommendations to the CIMO Management Group on improvements to the Regional Instrument Centres, CIMO test beds and lead centres and on the needs for standardization of remote sensing technologies.

2.6 Dr Dibbern also participated in the Workshop on Quality Monitoring and Incident Management (10-12 December 2014), organized under ICG-WIGOS on the initiative of the Chair ET-SBO. The purpose of the Workshop was to draft a concept of the WIGOS Data Quality Monitoring System (WDQMS), based on the inventory of current monitoring activities by several organizations, such as ECMWF, EUMETNET, NCEP and to identify a procedure for their harmonization, improvement and modernization.

2.7 Chair IPET-WIFI also participated in "The second ad hoc Workshop on Observing System Design (OSDW2)", of the IPET on the Observing System Design and Evolution (IPET-OSDE), which was held at the WMO Headquarters in Geneva, Switzerland from 2 to 4 February 2015 and was chaired by the Chair of the IPET-OSDE, Dr John Eyre (United Kingdom). The workshop further developed draft high-level OSND guidance materials, based on the OSND principles which had already been included in the Manual on WIGOS.

2.8 A teleconference of the sub-group chairs of IPET-WIFI had been conducted on 11 February 2015 to report on progress and plans, during which the work plan had been discussed and updated.

2.9 Regarding issues faced by IPET-WIFI, Dr Dibbern advised the session that WMO has been notified that Kevin Schrab (USA), will no longer serve as the Chair of SG-QM, and that Mr. Robert W. Grumbine had been nominated to replace him.

2.10 There is a close relationship between ICG-WIGOS and IPET-WIFI, with both groups having similar Task Teams/Sub-groups. IPET-WIFI addresses GOS related integration aspects of WIGOS as defined in the WIGOS Framework Implementation Plan, based on the guidance of ICG-WIGOS, and has made significant contributions towards the WIGOS Implementation. However, representation of other Commissions (the inter programme aspect) is mainly provided at the ICG-WIGOS meetings. Taking the new focus of the WIGOS Pre-Operational Phase (2016-2019) into account, Dr Dibbern requested the session to commence discussion under agenda item 10 on the future governance structure that will ensure effective use of expert resources. An ICG-WIGOS Task Team meeting on the plan for the pre-operational phase will be held from 15-17 September 2015 in Geneva, at which IPET-WIFI will be represented by its Chair.

2.11 Dr Dibbern recommended that the session review the progress in the assigned tasks of the WIP Key Activity Areas. In particular it would be important to obtain updates from:

- SG-RM: coordination of changes to the Manual on the GOS to align with the WIGOS Material;
- SG-MD: review of WIGOS Meta Data standards and coordination of input to ICG-WIGOS TT-WMD;
- SG-QM: the meeting should discuss how the work plan tasks can be finalized by CBS-16 and give advice to the new chair on the co-operation with the ICG-WIGOS TT-WQM;
- SG-OD: the current role of the SG-OD is mainly to respond to requests for advice from the WMO/MeteoSwiss project team. The Pre-Operational Phase of WIGOS (2016-2019) will include further development of the WIR focusing on OSCAR/Surface, development of the WIGOS data quality management system, and concept development for and initial implementation of regional WIGOS Centres. For all these activities OSCAR will be central, so the continuation of an 'expert team' focused on OSCAR will be required. The meeting was requested to discuss future TORs for this group.

2.12 In consideration of Dr Dibbern's report, it was suggested that a knowledge of the timeline of key future WMO meetings would aid understanding of the critical timeline for key IPET activities. The session was informed that the key WMO meetings would be:

- TT PWPP: mid-September, 2015;
- CBS MG: 14-17 December 2015;
- ICG-WIGOS-5: early 2016 (to dovetail with PTCs/RAs in late January 2016)
- ICT-IOS: April 2016
- EC-68: June 16 (at which it will be decided who chairs ICG-WIGOS thereafter)
- CBS-16: (probably) November 2016 (in China)

Hence two pathways were of note: the pathway to CBS-16, which requires substantial completion of CBS activities in time for ICT in April, and the pathway to EC-68, which requires substantial completion of WIGOS work in time for ICG in early 2016. It was also noted that important WIGOS implementation decisions will be needed as each Regional Association holds its one session in the coming 4 year period, the first one to be prepared for is RA-II (Asia) expected in November 2016.

3. REVIEW OF TERMS OF REFERENCE AND DRAFT WORK PLAN

3.1 The session was reminded of its current Terms of Reference, as approved by CBS-Ext (2014). The IPET's current Work Plan, as updated at its last teleconference in February 2015, was reviewed and the session was reminded of the progress that had been achieved against each of the assigned task by that time.

3.2 Some discussion followed of the degree to which the IPET has managed to engage the other technical commissions and in so doing serve as a true inter-programme team. It was realized that only limited collaboration has been achieved, yet it was noted that CHy, CIMO, CAgM and CAeM had all been represented and involved. Despite ongoing efforts there had been very little engagement with the space programme.

4. STATUS OF WIGOS FRAMEWORK IMPLEMENTATION

4.1 Dr Riishojgaard briefed the session on the relevant recommendations and decisions of CBS-Ext (2014), ICG-WIGOS-4 and Cg-17, and on the WIGOS Pre-Operational Phase.

4.2 He commenced with a brief history of WIGOS, noting that it had formally come into existence when Cg-16 decided that WIGOS would be implemented during the 2011-15 financial period. ICG-WIGOS was established to oversee the development and at its second session reviewed the WIGOS Framework Implementation Plan (WIP) which had been approved by EC-64. ICG-WIGOS-3 reviewed progress on key areas of 'implementation' including WIGOS regulatory

material (including text for the WMO Technical Regulations and the Manual on WIGOS, the latter of which was to include a WIGOS metadata standard), Regional WIPs for each of the six WMO Regions (approved by the respective RA session), and the WIGOS Information Resource (WIR), including the Observing Systems Capabilities Analysis and Review Tool (OSCAR).

4.3 At Cg-17, the WMO Technical Regulations on WIGOS were approved, as was the Manual on WIGOS, including the WIGOS Metadata Standard, and by this time all six Regional WIPs had been approved by their respective Regional Associations. Dr Riishojgaard acknowledged IPET-WIFI's significant contribution to this successful outcome. In view of this success in the implementation of the WIGOS Framework, Cg-17 agreed with an ICG-WIGOS proposal for WIGOS to now enter its Pre-Operational Phase and requested a formal plan for this phase to be prepared and presented to EC-68.

4.4 Dr Riishojgaard stressed that at present only the WIGOS Framework is in place, but that we are now ready for full implementation over the coming four years. The focus will now shift to regional/national implementation. Five priority areas have been identified and approved by Cg-17. The first task is to develop the Plan for the WIGOS Pre-Operational Phase (PWPP) and submit this to EC-68 for approval. ICG-WIGOS has formed a new task team for this purpose (TT-PWPP) which will meet in Geneva from 15 to 17 September 2015, and will address the five required priorities, including:

- WIGOS Regulatory Material, supplemented with necessary guidance material;
- WIR, including OSCAR (especially OSCAR/ Surface)
- WIGOS Data Quality Monitoring System (WDQMS)
- Regional Structure (Regional WIGOS Centres)
- National WIGOS Implementation, coordination and governance mechanisms.

4.5 The Guide to WIGOS will include, as a priority, material on:

- WIR (including OSCAR Surface)
- WDQMS (and data availability)
- WIGOS Regional Centres (roles and responsibilities, establishment, partners, review and accreditation process)
- Development of national partnerships (both public and private, integration of 3rd party data)
- Development of a National Observing Strategy
- Design, procurement, and operation of observing networks, especially AWS.
- Integration of space-based observations

4.6 OSCAR/Surface will be a modern, electronic, searchable inventory of all observational assets (stations/platforms) under WIGOS. It is being developed jointly by WMO and Meteoswiss, with Switzerland providing much of the funding. It will replace 'Volume A' and include inventories for other (non-GOS) WIGOS components. With it will be education and training of Members in populating, editing and using the tool. It will require full implementation of metadata standards and WIGOS station identifiers.

4.7 The WIGOS Data Quality Monitoring System (WDQMS) will enable 'real-time' monitoring of data performance (data availability and quality) for all WIGOS components, and analyse trends over time. It will be searchable by region, country, station type, period, and will be updated regularly (for the GOS, 6 hourly). It is being developed through a pilot project with ECMWF and NCEP, which is underway. A model for delayed mode monitoring of data quality, as measured against reference sources (GAW and Climate data monitoring), will also be developed.

4.8 Support for the regional implementation of WIGOS has been requested of the WIGOS Project Office by many Members, yet this support might be better provided by regional entities,

such as Regional WIGOS Centres. Their general role would be to monitor, coordinate and support the implementation activities in the respective region/sub-region. Specific areas of responsibility might be:

- regional performance monitoring of WIGOS networks (data availability),
- regional monitoring of observational data quality (especially for those not used for global NWP),
- fault management (follow-up with data providers),
- assist in regional network design,
- regional coordination of WIGOS implementation activities,
- coordination of regional calibration activities,
- training.

4.9 Members have also been requesting guidance on the development of national partnership agreements, the integration of 3rd party data, approaches to quality management, and data policy issues. Provision of WMO assistance with these efforts will be a topic of discussion at TT-PWPP later in September 2015.

4.10 Dr Riishojgaard briefly noted a number of activities underway in WIGOS Project Office, including preparations for several Regional Workshops, for Regional OSCAR training, and for various upcoming meetings, including TT-PWPP-2 (Sep), TT-WMD-4 (Oct) and a workshop on WDQMS (Nov).

4.11 Current concerns, issues and challenges facing WIGOS include the following:

- WIGOS is a 'project' not a programme, so has no permanent place in the WMO structure. Once its implementation is complete it will need to transition seamlessly into the WMO structure, yet neither the WMO Programme structure nor its technical commission structure are well-matched to this requirement at present. The issue is well-recognised and a transition strategy will need to be developed during the WIGOS Preoperational Phase. Dr Riishojgaard suggested that in the long term a restructuring of the technical commissions should be considered. He noted that this issue has relevance to IPET-WIFI: ICG-WIGOS task teams and IPET-WIFI sub-groups have similar names and responsibilities. Are both required?
- The WIGOS Guide is much needed but should it be comprehensive and replace existing guides, or should it merely provide well-structured links to the information existing elsewhere? Dr Riishojgaard noted that even under the latter model, there is a need for a significant amount of new guidance material to be developed (OSCAR, WIGOS metadata, station identifiers).

4.12 In subsequent discussion of the points made in Dr Riishojgaard's presentation, it was suggested that the issue at the national level of greatest challenge to Members and with which they most required guidance from WMO is that of dealing with so-called 3rd party data so this should be tackled with priority. It was also noted that care must be taken not to attempt more than can be accomplished during the WIGOS Pre-Operational Phase, and that the Regional WIGOS Centre model involves some significant risks hence it is important to ascertain whether it will be an efficient and effective mechanism before implementing it.

5. WIGOS REGULATORY MATERIAL

5.1 Mr Russell Stringer, Chair of the Sub-Group on Regulatory Material (SG-RM), reported on progress achieved by the sub-group since the second meeting of IPET-WIFI in March 2014 and foreshadowed the work to be carried out during the coming year in the lead-up to CBS-16.

5.2 Mr Stringer described the important milestone reached at Cg-17 with its approval of the new WIGOS Technical Regulations, the new WIGOS Manual and the significantly modified Manual on the GOS, all to come into effect from 1 July 2016 (by which time an initial Guide to WIGOS is to be available to Member countries). Congress had noted that further revisions of the Manual on the GOS will be synchronised with revisions of the WIGOS Manual, leading to the eventual phasing out of the Manual on the GOS. Congress had also confirmed a level of flexibility to make such revisions in the coming four-year period before Congress meets again – by giving Executive Council authority to approve amendments to WIGOS technical regulations and Manual, and extending the application of CBS “fast track” procedures to include the Manual on the GOS. (Cg-17 Resolutions 24, 25, 26).

5.3 Mr Stringer summarized the key activities of SG-RM since IPET-WIFI-2. He noted that there has been ongoing collaboration between SG-RM and TT-WRM, greatly facilitated by having the same person in the role as Chair of the two groups. This underpinned the synchronisation of content as the new WIGOS Manual was developed and the Manual on the GOS was heavily revised. Drafting of substantial revisions to the Manual on the GOS were completed during and after IPET-WIFI-2 in March 2015, leading to a proposal to ICT-IO-8 in April 2014 for the 2015 edition of the Manual on the GOS. Translation into the WMO official languages was completed in time to present the proposed new edition of the Manual on the GOS to the CBS extraordinary session in September 2014 (CBS-Ext (2014)). Translation of the proposed new WIGOS Technical Regulations and WIGOS Manual was also completed in time to present them to CBS-Ext (2014). The Commission endorsed those documents and recommended them to Congress-17 in May 2015, where they were approved.

5.4 Mr Stringer noted that the Manual on the GOS is to be incorporated into the WIGOS Manual in achievable steps. During this transition period the GOS is regulated by both Manuals. Also, new CIMO regulations are being developed in the WIGOS Manual, hence a new CIMO Manual will not be separately developed.

5.5 The most significant changes to the Manual on the GOS include:

- An updated introduction which explains the transition to the WIGOS Manual;
- Removal (move to the WIGOS Manual) of:
 - Most of Part II (Requirements for observations),
 - GAW provisions in Part III (Surface-based subsystem),
 - All of Part IV (Space-based subsystem),
 - All of Part V (quality control), and
 - A large component of the Definitions;
- Added new provisions for GRUAN,
- Elaboration on assignment of station index numbers,
- A target of higher frequency surface synoptic observations, and
- Strengthened references to metadata.

5.6 Mr Stringer advised that the follow-on steps that were to be tackled at and following IPET-WIFI-3 included:

- documentation of the timeline for the approval, review and translation steps leading up to CBS-16 in 2016, then Congress in 2019, and
- identification of the changes planned for the Manual on the GOS in synchronisation with changes to the WIGOS Technical Regulations and the WIGOS Manual.

5.7 Mr Stringer then provided further detail on the latter of the above sub-tasks, noting the need to:

- Adopt new material for inclusion, either in the GOS or WIGOS Manual, from:
 - ET-SBO: several aspects - AWS, remote sensing systems (radars, profilers), and possibly more.
 - ET-ABO: documents re AMDAR.
 - Other material.
- Develop a new description of surface-based subsystem overall, including the RBON (Regional Basic Observations Network)
 - Currently described as a list of elements - different types of stations, contributing to essentially independent types of networks
 - each with its own purpose, definition and description,
 - hence its own type of data to collect & what locations for that purpose,
 - & hence also frequency and timing of observations for that purpose.
 - WIGOS seeks a more integrated approach, such that all stations take a broad view and aim to meet as many requirements as possible of as many WMO application areas as possible.
 - That will be a challenging task, noting that Part III will need to be reformulated in total.
- Transfer "Equipment and methods of observations" material (Part III section 3) to Manual on WIGOS
- Decide what to do with "Requirements in special circumstances" (EER, volcanic activity, etcetera)
- Move more content to the Manual on WIGOS:
 - Possible steps after 2015 edition: 2017 update (EC), 2016 &/or 2018 update? (EC)
 - Complete replacement ready for Congress 2019?
- Review of Manual on the GOS, Volume II, Regional Aspects (perhaps this will be phased out too, similar to other WWW manuals.)

5.8 Mr. Stringer's presentation was followed by good discussion of several of the points raised:

- It was agreed that no further changes should be made to the WIGOS Manual before it comes into effect on 1 July 2016.
- Dr Riishojgaard circulated a 'strawman' draft of the WIGOS Guide to all participants and requested comments and suggestions to be forwarded to the WIGOS Project Office, which has primary responsibility for preparation of this document. The session agreed to discuss the document later in the session.
- It was noted that the WIGOS-Guide will take the "thin layer" approach proposed by TT-WRM and accepted by ICG-WIGOS-3. It will provide references to other pre-existing WIGOS-relevant Guides and guidance material, which will continue to be updated by the relevant owners. It will include new material as necessary, in particular the first edition that is required before 1 July 2016 must include new material to enable Members to comply with the new WIGOS regulations such as those relating to metadata, station identifiers, and so on.
- It was suggested that, with regard to the Regional Basic Observing Network concept (the WIGOS replacement for RBSN and RBCN), there would be a need to develop the concept further than that described in the Information document presented to CBS Ext (2014) by WMO Secretariat (agenda paper "CBS-Ext(2014)-INF-3-1(1)-RBON_en.docx"). It was also noted that Dr Dibbern, as Chair CBS IOS, had been given an action by ICG-WIGOS-4 to "Develop the RBON concept and high-level generic guidance as a priority issue". The session considered that perhaps a targeted meeting would be desirable for this. The session agreed to review the CBS document and revisit this item later in the session.

- There was uncertainty about how different station/platform "types" would be classified in the future under WIGOS, compared to the existing types currently listed in the Manual on the GOS. WMO Secretariat advised that they had prepared a series of draft concepts. It was noted that relevant information in the WIGOS MetaData Standard includes code table no. 4 within Category 3 which recognizes 5 "station types", together with the separate listing of "primary purpose" of the station (a code table of about 20 alternatives, roughly the WMO application areas plus a few others).
- With regard to the question of whether WIGOS would relax the requirement to observe prescribed synoptic observing times for the GOS (e.g. 12 and 00 UTC), the session agreed that this was a network design topic which should be a matter for IPET-OSDE to provide advice on.
- With regard to the possibility that there might be EGOS-IP actions that could help to inform new regulations, the session agreed that the EGOS-IP actions serve as good technical guidance for Members, and that if enough Members agree with a particular action, then it might be elevated to a standard or recommended practice in the future.
- With regard to a potential need for more regulations or guidance material on how to manage our increasing use of non-NMHS observations in WIGOS, the session agreed that relevant regulations are now in the Manual on WIGOS, it is more guidance material that is required now, especially to assist National implementation and the establishment of relationships and partnerships. Provision of metadata is important and in particular the "quality indicator" element of the metadata.
- On the topic of "voluntary networks" the session discovered various concepts of what this label meant. In any case it agreed that there is no obvious need at present for additional regulations as the new regulations already cover observations from non-NMHS sources, both manual and automatic observations, both synoptic and climate observations, and so on.

6 OSCAR DEVELOPMENT

6.1 Mr Gilbert, Chair of the Sub-Group on OSCAR Development (SG-OD), introduced the session to the work of the sub-group. A comprehensive database of metadata is widely recognised as a central pillar in the implementation of WIGOS and the tool for providing access to this is OSCAR. In the immediate term, the focus of SG-OD will be on the development and implementation of OSCAR/Surface although the group will also maintain an overview of OSCAR/Space and OSCAR/Requirements.

6.2 The first meeting of the IPET-WIFI SG-OD took place on the 6-8 July 2015 at the headquarters of DWD in Offenbach. The meeting was held conjointly with an ad hoc Workshop on the Rolling Review of Requirements Gap Analysis Requirements for OSCAR (RRR-OSCAR). At the meeting, the status of the OSCAR/Surface development project was reviewed, advice was provided on outstanding issues and the likely future role of the SG-OD was discussed. The report of the meeting is available at <http://www.wmo.int/pages/prog/www/CBS-Reports/IOS-index.html>.

6.3 The accuracy of the metadata captured within OSCAR is of prime importance to WIGOS. Due to the cross cutting nature of WIGOS there can be many organizations within a WMO Member country involved in the provision of OSCAR/Surface content, so maintenance of the information will require a comprehensive mechanism to be developed. As well as metadata provided by individual data owners, OSCAR/Surface will also contain metadata obtained from various sources, including for example from national or regional databases, and programmatic global databases such as the World Data Centres (such as ozone, radiation, greenhouse gases, etc.) and JCOMMOPS (met-ocean observing platforms). This metadata will be obtained by bulk machine-to-machine downloads, so it will be critically important for errors in such metadata to be corrected at source, and a mechanism will need to be developed to facilitate this.

6.4 A pilot project is underway between the DWD, MeteoSwiss, and the WMO Secretariat for the development of a generic machine-to-machine interface between national WIGOS metadata databases and OSCAR allowing the automatic and routine update of OSCAR with metadata from such databases. The Pilot Project will involve defining appropriate interfaces, protocols, and formats in consultation with the CBS OPAG-ISS. The national database of DWD for WIGOS metadata will be used for the pilot project.

6.5 In contrast with OSCAR/Space, much more of the responsibility for maintenance of OSCAR/Surface content will need to lie with the owners of the data, the WMO Member organizations and their appointed staff, to ensure currency of the information content of OSCAR and to correct or update it when required, although a centralized monitoring role (perhaps via a regional WIGOS centre) may also be warranted.

6.6 The transition from the maintenance and use of Volume A as WMO's primary repository of station metadata to OSCAR is a major sub-task in the development of OSCAR. To achieve this, the multiple dependencies on Volume A need to be taken into account, especially the Global NWP centres and for this there is a need to liaise closely with stakeholders at an early stage. OSCAR will have the capability to produce an output file that is structurally similar to Volume A, and this will allow users to transition from the use of Volume A to OSCAR over a two year period. It was noteworthy, though, that this file is not identical to Volume A and the importance of communicating this change to users at the earliest opportunity has been recognized.

6.7 The current role of the SG-OD is mainly to respond to requests for advice from the project team and to ensure that OSCAR/Surface implementation proceeds in line with expectations. In the longer term OSCAR will remain a central pillar to the implementation of WIGOS and therefore expert oversight will remain important. The group noted that the governance structure of WIGOS contains both the ICG-WIGOS and IPET-WIFI, and that a number of Task Teams / Sub-Groups (respectively) exist under both groups, and that this arrangement is susceptible to overlap/duplication. Mr Gilbert requested the session to keep this arrangement under review to ensure the effective use of expert resources and, if appropriate, to recommend to ICG-WIGOS changes to the TT structure. (This matter was considered further under Agenda Item 10.)

6.8 The actions and work plan agreed by SG-OD are provided in the report of the sub-group's first session, available at (<http://www.wmo.int/pages/prog/www/CBS-Reports/IOS-index.html>).

6.9 Following the presentation by Mr Gilbert, Rainer März, a member of SG-OD, provided a short presentation on the progress achieved to date by SG-OD in developing procedures for updating and maintaining the content of OSCAR/Surface. Mr Stringer noted that the draft procedures specify that national WIGOS Focal Points will be responsible for maintaining their country's information in OSCAR/Surface, and sought clarification on whether this task could be delegated to network owners where this was needed. The session agreed that this should be the case. Mr Stringer further noted that while much effort was being channeled into the development of OSCAR, there would be an equivalent capacity development and outreach effort needed to ensure that OSCAR take-up by Members is optimal. This includes a need for Members to be able to collect and manage the required metadata and enter it into OSCAR. Dr Riishojgaard reassured the session that extensive plans have been developed for this.

6.10 In closing this item, Mr Gilbert presented to the session the draft OSCAR Implementation Plan developed by the WIGOS Project Office, and requested session participants to provide feedback on the suitability of this document for providing a high level description of WMO's plans for OSCAR implementation, for feedback to the OSCAR Project Team.

7 WIGOS QUALITY MANAGEMENT

7.1 Mr Robert Grumbine, participating in the session by teleconference in place of Mr Kevin Schrab, Chair of the Sub-Group on Quality Management (SG-QM), provided a status report on this sub-group's activities since IPWT-WIFI-2. He noted that there had been very little activity within

SG-QM itself since IPET-WIFI-2 but that the work it was performing had been transferred across to the ICG-WIGOS activities on the WIGOS Data Quality Monitoring System (WDQMS).

7.2 Mr Grumbine then described the work underway in WDQMS. A WIGOS pilot project has been initiated involving exchange of performance monitoring data between NCEP, ECMWF. Only surface pressure data are being considered initially. The NWP centres will first check the data flow to ensure that the required data are being received by each centre. Once this is accomplished, the project will turn its focus to use of the data. If the NWP systems of each centre ingest and use the data in their assimilation process, it will provide an indication that the data quality is good. If one centre rejects the data, the reasons for this will be investigated. If both centres reject a data value this will indicate that either the data quality is poor or the assimilation first guess for that location is poor.

7.3 Dr Dibbern thanked Mr. Grumbine for his presentation and stressed to the session the importance of this work, which needs to be supported by IPET-WIFI as a priority. Dr Riishojgaard advised that ICG-WIGOS-4 had decided that this activity could be scaled back within IPET-WIFI, to allow it to focus more on the other WIGOS priority areas, with most of the quality monitoring work now to be carried out within the WDQMS activities and with IPET-WIFI's contribution provided primarily through Mr Grumbine's participation. Dr Riishojgaard noted that there is a need to recruit additional NWP centres to join the activity and that the formal agreement between WMO and EUMETNET will be extended to include monitoring the data from EUCOS.

7.4 Mr Monnik noted that when the matter of WIGOS metadata was raised some years ago, there had been agreement that quality monitoring feedback from NWP centres would provide useful information on the quality of observations, but that this has not ultimately been included in the WIGOS metadata standard. He suggested that instead it may be useful to retain the performance monitoring statistics as an additional WIGOS metadata set. Dr Riishojgaard agreed in principle that it would be very valuable to include this information in OSCAR, but noted that that would comprise a substantial task with associated risks.

8 WIGOS METADATA

8.1 Mr Karl Monnik, Chair of the Sub-Group on Metadata, summarised the work performed by this sub-group in recent months, the outcomes of Cg-17 and EC-67 of relevance to the work of the sub-group, and the plans for further work by this sub-group leading up to CBS-16 in 2016.

8.2 Mr Monnik had been invited to a special meeting of ET-SBO, 24-28 November 2014, which had as its focus preparation of WIGOS regulatory material RM related to AWS, Weather Watch Radars and Wind Profiling Radars. Included in the material for that meeting were explicit references to recording, storing and international distribution of observations metadata which paved the way for more explicit treatment of metadata in WIGOS networks.

8.3 Mr Monnik noted that the ongoing collaboration between SG-MD and TT-WMD has been greatly facilitated by having the same person as Chair/Co-chair of the two groups and that this will continue to be beneficial as the WIGOS Metadata Standard (WMDS) is implemented through the OSCAR Surface. He reminded the session that the WIGOS Metadata Standard, approved by Cg-17 is available online at: <https://drive.google.com/file/d/0B8DhC1GSWSmxb25zTzJpUFNzcjA/view>

8.4 The standard comprises ten categories of metadata, and reporting of each metadata type in each category is classified as either mandatory, conditional or optional. He described the adopted three stage process for implementation of the standard: Phase I includes only the most essential items, Phase II includes an additional subset of metadata considered to be particularly important and Phase III will include all those remaining.

8.5 SG-MD was represented at a video-conference between OSCAR, WIGOS Metadata and the Inter-Programme Expert Team on Metadata and Data Representation (IPET-MDRD) held from 19 to 20 Aug 2014. This was an exploratory meeting for MDRD members to understand the scope

of WIGOS Metadata with a view to the eventual formal coding of a IT standard. This teleconference was followed by a face-to-face meeting of IPET-MDRD in Melbourne, from 22 to 25 June 2015, which Mr Monnik attended on behalf of SG-MD. The purpose of this meeting was to begin developing a generic data model for the WMDS, the first step towards design of an application schema. That meeting decided to use as the basis for WMO metadata exchange, Observations and Measurements ISO 19156:2011. The session requested some instruction on interpretation of ISO 19156, should time permit and suitable expertise be available at UKMO. Mr Gilbert suggested that he would contact Mr Jeremy Tandy and organize a presentation later in the session if possible.

8.6 With the release of the OSCAR/Surface for beta-testing, members of SG-MD were encouraged to access the database and add/edit metadata for a range of station types. Feedback from these tests has been provided to the OSCAR project team. OSCAR/Surface is accessible from the following link:

<http://oscar.wmo.int/surface>

8.7 With regard to the future work of the sub-group, Mr Monnik advised the session that priority would be given to:

- Familiarisation with the current version of the WMDS with a view to further development of example metadata lists for a range of GOS stations;
- Continuation of the review of OSCAR/Surface, keeping in mind the desire to develop training materials;
- Review of references to draft regulatory material concerning metadata;
- Investigation and provision of advice on methods for gathering, storing and exchanging GOS metadata;
- Development of guidance for standard and recommended practices, and for specific arrangements for metadata entry into OSCAR/Surface (in collaboration with SG-OD).

8.8 At the conclusion of Mr Monnik's presentation, the session discussed the related material that would be required for inclusion in the first version of the Guide to WIGOS (i.e. by 1 July 2016). It was agreed that this would need to include guidance on methods for gathering, storing and exchanging metadata and guidance on data entry into OSCAR, and that the preparation of guidance on these topics should be reflected in the workplan. It was also noted that the scheduling of these items would need to be coordinated with SG-RM and the WIGOS Project Office.

8.9 Dr Dibbern reflected that different activities related to WIGOS implementation, with implications for WIGOS regulatory and guidance material, were underway in many ETs, yet these activities are not necessarily synchronized with the schedule for the preparation of the WIGOS guidance material. The session agreed that there is an urgent need to review the timelines for deliverables of all CBS IOS teams working on WIGOS regulatory material, metadata and OSCAR development, and those of the IPET-WIFI sub-groups, to ensure adequate synchronization.

8.10 It was also noted that there may be a need to further review the WIGOS regulatory material, because, for example, at present it only requires Members to record metadata and make it available to WMO but does not explicitly require Members to send the data to WMO, nor to use OSCAR to do this.

8.11 The session agreed that Mr Stringer would update the schedule for delivery of WIGOS-related regulatory material and share this with the other sub-group chairs, who would add the schedule for the work of their respective sub-groups, rescheduled as required to be synchronized with the work of SG-RM and WIGOS Project Office. Subsequently, the overall timeline for the IPET would be shared with the chairs of other OPAG-IOS teams working on WIGOS, for them to synchronize their work with that of IPET-WIFI (see also paragraph 10.8 in relation to the WIGOS Guide).

9 WIGOS FRAMEWORK IMPLEMENTATION: OTHER KEY ACTIVITY AREAS

Collaboration with Partner Organizations

9.1 Dr Arimatea de Sousa Brito's input document on this item was presented to the session by Dr Dibbern. It described the progress made on this item of the work plan since the last session of the IPET and the plans for completion of the scheduled work in the lead-up to CBS-16 next year. Dr Arimatea de Sousa Brito's report reiterated the importance to a successful WIGOS of collaboration with partner organizations, but noted that it had been difficult to progress this item early during the WIGOS framework implementation phase. More recently, since the development of the Regional WIPs, this task had become more achievable, though still has its challenges due to the complexity and diversity of the regional situations.

9.2 In Regional Association I, significant progress has been achieved in the collaboration area as demonstrated during Cg-17. In Regional Association III a different approach has been in place since the last RA III session (September 2014). In this case, a WIGOS project has been developed which involves five countries, their respective NMHSs and Water/Energy Agencies, encompassing three distinct communities: Meteorology, Hydrology and Climatology. The objective is to apply the WIGOS Framework to an already operating mixed observation network and hydrometeorological warning system. This project requires a complex regional collaboration as well as a complex national collaboration. Several meetings, funded by different agencies, have already taken place and a detailed project is being developed. The involvement of high and middle level managers of concerned NMHSs/Agencies is proving crucial.

9.3 Dr Arimatea de Sousa Brito noted in his input that the approach of listing organizations as potential candidates for collaboration is difficult as the possibilities are enormous and varies from country to country or from one region to another, but that some general principles can be deduced. He stressed that at the global level, the predominant responsibility for improving collaboration must lie with the WMO secretariat. At the regional level, the first task is to identify common requirements, then the communities involved. Once this is done, WIGOS is the most appropriate mechanism for improving standardization of observations. The national level sees the greatest diversity of organizations hence requires the greatest effort to ensure installation of observing stations in safe places, for data collection and transmission and for use in respective applications. For each of these, a different administrative mechanism is required, respecting national practices and legislations. What is important is the existence of an assurance clause, stating the absolute requirement of compliance with the WMO/WIGOS Technical Regulations.

9.4 The session expressed its support for Dr Arimatea de Sousa Brito's recommendation that this task of the work plan remain open during the pre-operational phase of WIGOS.

Observations Practices

9.5 Dr Volker Kurz described the progress made by the IPET since its last session in regard to identifying standard and recommended observations practices and developing regulatory or guidance material for WMO members. Appropriate material from the CIMO Guide had been incorporated into the WIGOS Manual and a new edition of CIMO Guide, in part reflecting these changes, was approved by CIMO-16. Dr Kurz noted that need to continuously monitor the CIMO Guide for elements appropriate for elevation to the WIGOS Manual.

9.6 Regarding this task in the work plan, Dr Kurz noted the need for the ongoing elements of this activity to continue: one of these is regular scanning of the CIMO Guide for candidates for elevation; the other is ensuring coherence of material that appears in the WIGOS regulatory material and RM and also in ISO standards. Dr Kurz notes that this work will be carried out by the CIMO Editorial Board, and that he would present a proposal to the CIMO Management Group on this topic.

9.7 Mr Stringer noted that this activity is part of a broader requirement for ongoing synchronized review/update of material in the WIGOS regulatory material. RM. He noted that ICG-WIGOS currently has overall responsibility for this but after 2019 a mechanism will be required for this to be done within the technical commissions, and that an efficient mechanism may be an annual coming together of representatives from all technical commissions to suggest new candidates for inclusion in the WIGOS regulatory material. Dr Kurz suggested that, to be successful, this activity would require a champion, and that adoption a similar mechanism for WIGOS as is in place for CIMO with the CIMO Editorial Board might be most effective.

WIGOS Capacity Development, and Communication and Outreach

9.8 Dr Dibbern reminded the session of the work carried out by IPET-WIFI under this task during 2013, when a significant contribution was made by Dr Zhao, on behalf of IPET-WIFI, to the development of WIGOS strategies for Capacity Development, Communication and Outreach. He noted that, having completed those sub-tasks, the role of IPET-WIFI had transitioned to one of providing advice on request. He informed the session that there had been little activity under this item since then, with primary responsibility lying with the WIGOS Project Office. In view of the focus that needs to be placed on regulatory material, metadata, and OSCAR development, Dr Dibbern questioned whether these secondary tasks in the work plan should now be closed.

9.9 Dr Riishojgaard described the significant progress that had been made by the WIGOS Project Office in progressing WIGOS capacity development, communications and outreach, by conducting numerous regional workshops addressing regional WIGOS implementation and, for example, by the preparation and distribution of WIGOS flyers at Cg-17 and the organization of several side events at Cg-17. Dr Riishojgaard agreed that the capacity development task might be closed, but that it is likely that the WIGOS Project Office will call on IPET-WIFI for assistance in drafting content for both capacity development and communications and outreach material in future. After some discussion, the session decided to retain tasks 9 and 10 in the workplan.

9.10 In regard to WIGOS communications and outreach, Dr Zhang advised the session of the opportunity to prepare a plain language article on the implications for Members of the WIGOS regulatory material, for the next edition of *MeteoWorld*, suggesting this might be contributed by IPET-WIFI. Dr Dibbern agreed, and suggested that he would draft an article in collaboration with the WIGOS Project Office.

10 STRATEGIC DISCUSSION: IPET-WIFI BEYOND CBS-16

10.1 The session considered the role of IPET-WIFI, as initially envisaged, and as practically realized to date, and how this role may need to change in the future, now that WIGOS enters its Pre-Operational Phase, now that the continuity of ICG-WIGOS is assured until 2019, and considering the competing priorities of the CBS IOS Expert Teams.

10.2 Dr Dibbern led the discussion, based on a schematic representation of WIGOS implementation responsibilities. He briefly described the history of IPET-WIFI since its formation at CBS-15, its relationship with ICG-WIGOS and its Task Teams and the complementary nature of IPET-WIFI's activities to date. He raised the question of whether, although OPAG IOS will continue after CBS-16, we will need to continue with IPET-WIFI or whether its activities might be better absorbed into those of ICG-WIGOS or the other OPAG-IOS ETs to achieve improved efficiencies. He also raised an alternative, suggested by Mr Stringer, that reduced use of teams under ICG-WIGOS while continuing teams under CBS IOS might be both more efficient than current arrangements and a clearer transition towards sustainable structures after 2019.

10.3 Dr Dibbern described the advantages and disadvantages of dissolving IPET-WIFI and absorbing its activities into ICG-WIGOS, its task teams and the other OPAG IOS teams.

10.4 The advantages include the CBS subject matter experts being directly involved in the task teams, no possibility of overlap/duplication of effort, better use of resources, and the representation of other TCs and RAs in the work of the task teams so greater 'authority' in their products.

10.5 The disadvantages are that this would break the link with IPET-OSDE, SG-OD would need to be replaced by a new ICG-WIGOS task team dealing with OSCAR development, and another new task team (or some other mechanism) would be required to coordinate contributions from different IOS ETs.

10.6 An additional advantage of absorbing the ICG-WIGOS activities into CBS expert teams would be a smooth transition of WIGOS management to CBS and CIMO, should ICG-WIGOS be disbanded from 2019. Dr. Zhang noted that it is most likely that ICG-WIGOS will not continue beyond Cg-18 in 2019. He also drew attention to the future need to reconcile the end-to-end nature of the World Weather Watch with the cross-cutting nature of WIGOS, suggesting an potential need in the longer term to modify the WMO programme structure. Dr. Zhang supported the absorption of IPET-WIFI activities into other teams following CBS-16, noting that the CBS responsibility for different WIGOS preoperational phase activities would need to be added explicitly to CBS expert team work plans.

10.7 Mr Stringer provided a closer examination of the cited reasons for discontinuing IPET-WIFI beyond CBS-17, noting that, despite concerns, there had been no duplication of effort between IPET-WIFI and the ICG-WIGOS task teams, but that their work had been complementary with a strongly positive effect overall. He agreed with the need for optimal efficiency of working arrangements during the new intersessional period of Congress in view of the tight WMO budget constraints. Mr Stringer suggested that an alternative to simple dissolution of IPET-WIFI may be to form a CBS IOS Expert Team on WIGOS Implementation Support.

10.8 It was also noted by the session that, as alluded to by Dr Kurz in his presentation, ICG-WIGOS may need to consider formation of a WIGOS Editorial Board to ensure harmonization and synchronization of all contributions to WIGOS regulatory material from different teams. In the meantime, the session agreed to document its planned contributions to the WIGOS Guide and convey these to the WIGOS Project Office to assist with WIGOS-wide coordination of this activity (see also paragraph 8.11).

10.9 In conclusion, the session noted that the Chair would present the alternatives and the pros and cons to TT-PWPP this month, with a view that it would be possible that all IPET-WIFI activities could be fully integrated into ICG-WIGOS teams or other CBS expert teams after CBS-16 and the IPET dissolved, but that this will require careful planning and further consideration subject to the future ICG-WIGOS task team structure.

11 REVISION OF THE WORK PLAN AND SCHEDULE

11.1 Taking into account its discussions during the session, the meeting updated its Work Plan activities and schedule (Annex II). The session agreed not to update the work plan with respect to Task 5 (Quality Management) until after the upcoming WIGOS workshop on the WIGOS Data Quality Monitoring System (WDQMS) which will be held in Geneva in November 2015.

12 OTHER BUSINESS

Metadata Representation

12.1 At the request of several participants, Mr Jeremy Tandy (UKMO) kindly agreed to provide a brief presentation to the session to describe the work underway within CBS ISS IPET-MDRD to define a standard for metadata exchange following the approval by Cg-17 of the WIGOS Metadata Standard.

12.2 It was noted that the WIGOS Metadata Standard is simply a list of metadata in text format, not easily recognized or handled electronically. To exchange metadata internationally, we need to follow a standard data format. Dr Tandy explained that IPET-MDRD had adopted the most suitable existing model, the ISO Observations and Measurements 19516:2011 Standard, and was using this a start point for developing a generic, machine-readable model for communicating metadata effectively between organizations. Mr Tandy described the structure of the standard which enables simple transcription into standard software for its representation.

12.3 Mr Tandy advised the session that the data model is to be delivered prior to CBS-16 and will be developed in close collaboration with the OSCAR Project Team. Mr Monnik agreed to continue in his role as the go-between between IPET-WIFI and its sub-groups and IPET-MDRD.

Regional Basic Observing Network

12.4 At the beginning of the meeting Dr Riishojgaard had shared with the participants an Information document from CBS-Ext (2014) concerned with defining a Regional Basic Observing Network to replace RBSN and RBCN and incorporate other sub-elements of WIGOS. He requested consideration of the document by the session and feedback to be provided to the WIGOS Project Office, which drafted the document.

12.5 Dr Dibbern opened the discussion by reminding the session of the Rolling Review of Requirements (RRR) process, with its 14 Application Areas, all of which are represented in OSCAR. He also noted that we have the Observing Network Design (OND) principles recently developed by IPET-OSDE, and will soon have guidance material on these principles from OSDE. These are all very important for the regions to enable them to design their observing networks. He stressed that it is important to be able to examine all networks when designing an observing system.

12.6 Dr Riishojgaard explained that, as a first step, the RBON will include RBSN and RBCN, but what other networks should be included from the outset? He also noted that the document would need to include guidance on how to approach network design.

12.7 Some confusion was noted in the document in regard to data requirements versus infrastructure requirements: it doesn't obviously commence with consideration of data requirements and only then turn to infrastructure solutions to satisfy those requirements. Dr Dibbern reminded the session that WIGOS will not itself deliver the details of the optimal global network: it will deliver the tools and the guidance material to help members design their observing system themselves. It was noted that the document currently contains no mention of space-based observations.

12.8 There was some support for the concept of tackling observations requirements and solutions primarily at the global and national levels, with regionalized assessments not constrained to the six WMO geographical domains. However it was noted that from our current starting point we need the RBON component because it will define the sites for which Members agree to exchange data internationally.

12.9 The session agreed that an RBON is unlikely to need to include urban stations, or, in general, road weather stations, except in those cases where the road comprises an international route. It was noted that inclusion of hydrological and GAW stations would be difficult for this first iteration of the concept.

12.10 After further discussion it was agreed that the RBON concept belongs to IPET-WIFI, which needs to give more thought to RBON off-line and advance the draft document to the next iteration for presentation to ICT-IOS next year. It was also noted that Dr Dibbern, as Chair CBS IOS, had been given an action by ICG-WIGOS-4 to "Develop the RBON concept and high-level generic guidance as a priority issue". It was suggested that a workshop on this topic could be arranged for

9 to 11 December 2015 and would need to involve Dibbern, Stringer, Eyre, Oakley, Ondras (if available), Riishojgaard, Zahumensky and a few regional representatives.

WIGOS Guide Content and the Volume A to OSCAR Transition Plan

12.11 Two additional documents circulated to all participants during the session by the WIGOS Project Office were a draft table of contents for the WIGOS Guide and the draft Volume A to OSCAR Transition Plan, with a request that the session review these two documents during the session and provide feedback on them to the WIGOS Project Office.

12.12 In view of the lack of time remaining in the session, the participants agreed to examine these documents after the session and provide comments by email to all IPET-WIFI members and to the WIGOS Project Office.

13 DRAFTING OF THE MEETING REPORT

13.1 The session agreed to finalise the meeting report by correspondence after the session.

14 FUTURE MEETING SCHEDULE

14.1 With regard to future meetings of IPET-WIFI and/or its sub-groups, the session agreed to the following needs:

- Webex meeting of SG-RM from 11am to 1pm Geneva time on Wednesday, 21 October 2015;
- Webex meeting of SG-OD from 11am to 1pm Geneva time on 18 November 2015;
- Webex meeting of SG-MD during November 2015 (Mr Monnik to advise further after consultation);
- Webex meeting of IPET-WIFI from 11am to 1pm Geneva time on Wednesday, 16 March 2016 (to prepare the brief for ICT-IOS); and
- Webex meeting of IPET-WIFI from 11am to 1pm Geneva time on Wednesday, 24 August 2016.

15 CLOSURE OF THE SESSION

15.1 The session was closed on 4 September 2015 at 1200hrs.

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UPDATED WORK PLAN WITH STATUS FOR IPET-WIFI FOR THE PERIOD 2015-2016

Updated 4 September 2015

No. 1	Task	Deliverable/Activity	Due	Responsible	Impacte d ETs	Status	Comment
1.	Contribute to the development and maintenance of WIGOS regulatory material, both GOS-related material and provisions common to all component systems.	<p>1) input to TT-WRM, to assist and review the inclusion of material from GOS Manual and TRs into the WIGOS Manual and TRs (particularly for sections 2, 3 and 7)</p> <p>2) gather and review proposals for updated or new regulatory material to the TRs, WIGOS Manual and/or GOS Manual (as appropriate)</p> <p>3.1) clear plans (with TT-WRM) for the transition and eventual phasing out of the GOS Manual</p> <p>3.2) lay foundation , by undertaking some of the drafting steps, for completion of transition, after CBS-XVI (2016), from GOS Manual to WIGOS Manual</p> <p>4) Collaboration with TT-WRM and WIGOS P.O. on development of the WIGOS Guide</p>	<p>1) Oct 2013</p> <p>2) Apr 2016 (for next edition of WIGOS Manual), & ongoing.</p> <p>3.1) Nov 2015</p> <p>3.2) 2016</p> <p>4) May 2016 (for the initial Guide)</p>	<p>Stringer SG-RM Members</p>	<p>TT- WRM</p> <p>ICT- IOS all teams and rapporte urs</p>	<p>100%</p> <p>40% and ongoing</p> <p>60%</p> <p>50%</p> <p>30%</p>	<p>Interactions and feedback provided for TT-WRM on first drafts. , and further revisions up to endorsement by CBS and approval by Cg.</p> <p>Some WIGOS and GOS updates obtained from across CBS. Need further work on GOS Manual.</p> <p>Cg & CBS noted synchronized changes leading to phasing out, but more timeline planning needed Cg has approved the first synchronized Manuals on GOS and WIGOS. More steps are needed on GOS Manual changes.</p> <p>4) requested initial edition by July 2016. Some work underway.</p>

¹ Corresponds with WIGOS Activity Area Number.

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		5) develop a proposal, with TT-WRM, for a mechanism for ongoing review and update of regulatory material, for example a WIGOS editorial board	5) 2016			30%	Important to have all TC / programme collaborators participating
2.	Contribute to the development of guidance, mechanisms and procedures for engagement, coordination and collaboration with partner organizations.	1. Report on lessons learned from RA III Project on collaboration between meteorological and hydrological communities	Dec 2015	Arimatea	ICT-IOS	50%	
3.	Network Planning / RRR	Close cooperation between IPET-WIFI and IPET-OSDE, feedback to IPET-OSDE as required.	Ongoing	Dibbern Stringer	IPET-OSDE	80%	Stringer and Dibbern are both contributing to IPET-OSDE activities.
4.	Develop guidance on: 1) mechanisms and procedures for improved integration of GOS observational data and products, 2) process of sharing, between GOS and other component observing systems, operational experiences, sharing of expertise and guidance for resourcing joint activities	1. Contribution to guidance documentation on best practice for integration, quality control and maintenance of GOS observational data and products in RA I 2.1 Identification and documentation of issues that need to be addressed by regional cooperation, 2.2 Proposals for joint resources activities at the sub regional level.	1) Mar 16 2.1 Mar 16 2.2 Mar 16	Merrouchi Mosetlho	ICT-IOS ET- WISC- OM ICT-IOS	0% 0% 0%	¹ Proposed Method: Arrange for a session on this topic to be conducted as part of a WIGOS RA I workshop that is planned under ICG-WIGOS. ² Procurement, instrument maintenance, spectrum management, etc

No. 1	Task	Deliverable/Activity	Due	Responsible	Impacte d ETs	Status	Comment
5. *	<p>Provide advice to ICG-WIGOS via CBS on GOS Quality Management practices and procedures: 1) Finalise SG-QM Work Plan</p> <p>2) Establish a group of GOS observing sub-system focal points that can provide expertise and knowledge on QMon practices and regulations to SG-QM.</p> <p>3) Review the status of WMO and Regional quality monitoring</p>	<p>[Work Plan]</p> <p>2a) Finalise list of sub-systems to be reviewed by SG-QM;</p> <p>2b) Finalise list of GOS OS-S focal points. 2c) Create a FP email list for collaboration.</p> <p>[Group of OS-S FPs established.]</p> <p>3a) In consultation with TT-WQM determine the scope and requirements for the review to be undertaken by OS-S FPs. 3b) Review existing regulatory material related to QMon for GOS sub-systems.</p>	<p>Mar 2014</p> <p>Aug 2014</p> <p>2016 (CBS)</p>	<p>Secretariat Schrab</p> <p>Secretariat Schrab</p> <p>Schrab SG-QM</p>	<p>TT-WQM</p> <p>ET-ABO ET-SBO</p>	<p>100%</p> <p>100%</p> <p>a) 100% b) 20% c) 0%</p> <p>0%</p>	<p>SG-QM to review and reach agreement on work plan. Ch-TT-WQM to review and agree on work plan. Summarised plan to be updated in IPET-WIFI work plan (Final Report IPET-WIFI-2)</p> <p>Participation of Chair SG-QM required in WIGOS Quality Workshop (Apr 2014)</p> <p>Likely list of 6 GOS OSS for review of QM: (a) Surface synoptic stations (Land and Sea stations); (b) Upper-air synoptic stations (Land and Sea stations); (c) Aircraft meteorological stations; (d) Aeronautical meteorological stations; (l) Weather radar stations; and (n) Wind profiler stations.</p> <p>Can the scope for this task be expanded to quality management rather than just QMon?</p> <p>This task is a contribution to a parent task of TT-WQM</p>

No. 1	Task	Deliverable/Activity	Due	Responsible	Impacte d ETs	Status	Comment
	<p>systems with a view to identifying areas for improvement and efficiency</p> <p>4) For the land surface-based observing system, develop and document the concept of extending global quality monitoring to include a "Global Fault Management System"</p>	<p>3c) Review existing regional QMon systems and their procedure in place, for example ECMWF, EUCOS, etc. 3d) Prepare recommendations on new or improved QMon procedures in relation to GOS sub-systems.</p> <p>[Document that can be used as input to the deliverable of TT-WQM]</p> <p>4a) Review the outcomes of the ECMWF Workshops on NWP data monitoring requirements 4b) Revise, update and finalise the draft proposal developed by ET-SBO to define the scope and deliverable of this activity. 4c) Liaise with ET-SBO and ICT-GDPF regarding revision of the Manual on the GDPFS re requirements for monitoring of the GOS by NWP. 4d) Develop an updated plan and procedures for quality and quantity monitoring of land, surface-based observing systems of the GOS. 4e) Update appropriate manuals and guides based on the outcomes of this activity. 4f) Assist IPET-WIFI in reporting to CBS</p> <p>[1. Revised international structure and framework for international observations monitoring 2. Updated regulatory material on Qmon of land surface-based system of the GOS]</p>	<p>2016 (CBS)</p> <p>a) Aug 2014 b) Aug 2014 c) Feb 2015 d) Dec 2015 e) Feb 2015 f) Jun 2016</p> <p>2016 (CBS)</p>	<p>Schrab SG-QM ET-SBO</p> <p>SG-QM</p>	<p>TT-WQM ET-SBO ICT-GDPF ICT-ISS</p>	<p>100%</p> <p>??50%</p> <p>50%</p> <p>0%</p> <p>0%</p> <p>0%</p> <p>5%</p>	<p>and related to Activity 5.1.2 of the WIP.</p> <p>Include consideration of the possibility of combining the roles of global quality and quantity monitoring.</p> <p>To improve the feedback mechanisms and process so as to better ensure the identification and rectification of missing data, station outages and specific quality issues.</p> <p>Include consideration of the possibility of combining the roles of global quality and quantity monitoring.</p> <p>2nd workshop to be held in 3rd quarter 2014 – Ch-ET-SBO will attend.</p> <p>Take the lead in drafting QM material on GOS for Tech Regs (incl Common Elements of Surface Based Obs Systems) and WIGOS Manual.</p>

No. 1	Task	Deliverable/Activity	Due	Responsible	Impacte d ETs	Status	Comment
	<p>5) In consultation and collaboration with TT-WQM, develop and revise QM and QMon regulatory material and guidelines for inclusion in WIGOS and GOS regulatory materials.</p> <p>6) Contribute to the drafting work of TT-WRM in collaboration with SG-RM and provide GOS-related feedback through SG-RM on TT-WRM documentation.</p>	<p>5a) Liaise with ET-SBO and ICT-GDPF re appropriate location for regulatory material relating to monitoring of the GOS by NWP.</p> <p>6a) Provide feedback to TT-WRM on current draft version of the Manual on WIGOS with respect to quality monitoring aspects.</p> <p>6b) Do it again for next version</p>	Mar 2014	SG-QM	<p>ET-SBO ET-ABO IPET-GDPF</p> <p>TT-WRM</p>	100%	<p>Task leader will participate in TT-WRM teleconferences.</p> <p>This task is a contribution to WIP Activity 5.1.1</p>
6.	<p>1) describe the standard practices and recommended practices for collecting observations, applicable to instruments and methods of observation with a focus on the GOS</p> <p>2) provide guidance to Members on how to implement those standard and recommended practices</p>	<p>1.1) existing standard practices and recommended practices, described in a manner suitable for inclusion in WIGOS regulatory material (TRs or Manual on WIGOS)</p> <p>1.2) proposed new standard practices and recommended practices, described in a manner suitable for inclusion in WIGOS regulatory material (TRs or Manual on WIGOS)</p> <p>2.1) identify and if necessary further develop guidance on how to implement those existing standard and recommended practices, described in a manner suitable for inclusion in a relevant Guide (WIGOS, GOS, CIMO or other guidance material).</p>	<p>Nov 2013</p> <p>Dec 2016</p> <p>Nov 2013</p>	Kurz IPET-WIFI Members	<p>CIMO ETs (CIMO Ed Board, Standar dization) TT- WRM SG-RM</p>	<p>100%</p> <p>ongoing</p> <p>100%</p>	An annual Activity

No. 1	Task	Deliverable/Activity	Due	Responsible	Impacte d ETs	Status	Comment
		<p>2.2) guidance on how to implement the proposed new standard and recommended practices, described in a manner suitable for inclusion in a relevant Guide (WIGOS, GOS, CIMO or other guidance material).</p> <p>2.3 maintain a watching brief on existing guidance material with a view to identifying candidates which have become ready to be elevated to the WIGOS regulatory material as observing systems mature.</p>	<p>Dec 2016</p> <p>Dec 2016</p>			<p>Ongoing</p> <p>Ongoing</p>	<p>An annual Activity</p> <p>An annual Activity</p>
7	<p>1) Lead and coordinate the drafting of updated OSCAR Update/Maintenance Procedures</p> <p>2) Oversee development and provide feedback on an OSCAR "User Guide"</p>	<p>1. Request relevant ETs to review and update OSCAR/Space and OSCAR/Requirements Update/Maint doc.</p> <p>2. Add OSCAR/Surface procedures including the Quality Management of data that has been identified as questionable.</p> <p>3. Submit to IPET-WIFI for review and approval by Chair OPAG-IOS.</p> <p>1. Beta test OSCAR</p> <p>2. Assist OSCAR Project Team to develop User Guide. (incl FAQs)</p> <p>3. Oversee review of Guide</p>	<p>1. 10/15</p> <p>2. 12/15</p> <p>3. 01/16</p> <p>1. 08/15</p> <p>2. 11/15</p> <p>3. 01/16</p>	<p>Rainer Rabia</p> <p>Uli All</p>	<p>ET-SAT, IPET-SUP, IPET-OSDE, ET-ABO, ET-SBO</p>	<p>1. 20%</p> <p>2. 0%</p> <p>3. 0%</p> <p>1. 100%</p> <p>2. 0%</p> <p>3. 0%</p>	<p>1. Request circulated to relevant ETs end August 2015. Awaiting responses.</p> <p>Onus to be on WMO Members for maintenance of content of OSCAR/Surface Chair OPAG-IOS to submit the doc to ICG-WIGOS Project Team to be kept in the loop</p> <p>1. Beta test period now complete</p> <p>2. Awaiting straw man document from PO.</p> <p>Straw man done.</p>

No. 1	Task	Deliverable/Activity	Due	Responsible	Impacte d ETs	Status	Comment
	<p>3) Lead and coordinate development of a mechanism for the provision of OSCAR User Support with primary focus on Content</p>	<ol style="list-style-type: none"> 1. Draft high level doc describing overall process for OSCAR user support 2. Assist in the implementation of a second line response mechanism to deal with content enquiries. 3. Participate in provision of support to users, redirecting enquiries to Subject Matter Experts if required 4. Provide feedback (via Uli) for User Guide input. 	<ol style="list-style-type: none"> 1. 10/15 2. 1/16 3. Ongoing 4. Ongoing 	<p>Simon All</p>		<ol style="list-style-type: none"> 1. 0% 2. 0% 3. 0% 4. 0% 	<p>Feedback from beta testers to be incorporated. SMEs to provide content as required WIGOS PO will set up google forum.</p> <p>1. Awaiting PO to circulate draft document and creation of forum.</p> <p>OSCAR Project Team to implement Forum plus email group. MeteoSwiss to provide first line support (IT). Close monitoring of resources required. NWH response to user queries within agreed time</p>
	<p>4) Review the plan prepared by the WIGOS PO for transition from the use of Volume A to OSCAR.</p>	<ol style="list-style-type: none"> 1. Review 1 page simple summary document outlining the plan. 2. Review and provide a recommendation to IPET-WIFI on the draft plan for transition from VoIA to OSCAR. 3 Report back to OSCAR Project Team on IPET-WIFI endorsement. 	<ol style="list-style-type: none"> 1.09/15 2.09/15 3.10/15 	<p>Rabia All</p>		<p>100%</p>	<ol style="list-style-type: none"> 1. Document circulated and approved by IPET WIFI – 3. 2. As above Pending on above decision

No. 1	Task	Deliverable/Activity	Due	Responsible	Impacte d ETs	Status	Comment
8.	1) Compile and provide input to the development of WIGOS (interpretation) metadata, focusing on the GOS component.	1.1 GOS input provided to ICG-WIGOS TT-WMD	1.1 Jun 2013	Monnik Members of SG-WMD	TT- WMD	100%	
		1.2 Review and provide feedback on the Core Metadata list developed by TT-WMD, prepare populated examples (e.g. for surface station, radar, etc.)	1.2 Nov 2013			100%	
		1.3 Seek feedback on 1.2 from the technical experts across all areas of OPAG IOS.	1.3 Sep 2014			100%	
	2) Compile and provide input to the development of approaches for gathering, storing and exchanging WIGOS metadata, focusing on the GOS component. This should lead to a number of standard practices and recommended practices for Members to follow.	2.1 drawing on OPAG IOS expertise, review and complete outstanding WMDS code tables for consideration by TT-WMD, with priority given to Phase 1 fields.	2.1 Phase 1 – June 2016, Phase 2 – Jun 2017, Phase 3 – June 2018			30%	
		2.2 Develop guidance material suitable for the WIGOS Guide concerning WMDS elements.	2.2 Phase 1 – Mar 2016, Phase 2 – Mar 2017, Phase 3 – Mar 2018				With a view to inclusion in the 2016 version of the Manual on WIGOS
		2.3 In cooperation with SG-OD contribute to the preparation of training materials for WIGOS metadata collection, storage and sharing of WMDS elements.	2.3 Jun 2016				

No. 1	Task	Deliverable/Activity	Due	Responsible	Impacte d ETs	Status	Comment
9.	1) Contribute to the development of a WIGOS capacity development strategy. 2) Contribute to WIGOS capacity development, as required.	1) Review and provide feedback to ICG-WIGOS on draft WIGOS Capacity Development Strategy. 2) Assist in the organization and conduct of WMO seminars/workshops on the benefits of regional cooperation (such as for design, implementation and management of observing systems).	Oct 2013 2014-2015	Pei IPET-WIFI Members	ICT-IOS	100% 0%	
10	1. Contribute to the development of a WIGOS Communications and Outreach Strategy (WCOS) and plan 2. Contribute to WIGOS communication and <i>outreach</i> activities	1. Provide feedback to ICT-IOS on the WIGOS Communications and Outreach Strategy (WCOS) and plan 2. Enhance understanding of WIGOS and its benefits at appropriate WMO meetings. 3. Contribute to WIGOS quarterly newsletter 4. Draft WIGOS article for Meteoworld in cooperation with WIGOS PO	Jun 2013 Ongoing Recurring Oct 2015	Pei All IPET-WIFI Members All Dibbern		100% Ongoing Ongoing 0%	
11	Improve future cooperation between IPET-WIFI and ICG-WIGOS	1. Propose to ICG-WIGOS that IPET-WIFI activities will be integrated into ICG-WIGOS TTs after CBS 16, if conditions permit	Nov 2016	Dibbern		0%	

*NOTE: Item No 5 will be updated after the proposed WDAQMS Workshop in November 2015