THIRD MEETING OF THE METEOROLOGY PANEL (METP)

WORKING GROUP ON METEOROLOGICAL INFORMATION EXCHANGE

(WG-MIE/3)

Montréal, Canada, 10-13 July 2017

FINAL REPORT

INTERNATIONAL CIVIL AVIATION ORGANIZATION

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Agenda Item 1: Welcome and opening of the meeting

1.1 Place and Duration

1.1.1 The third meeting of the Meteorology Panel (METP) Working Group on Meteorological Information Exchange (WG-MIE) was held in Montréal, Canada, at the International Civil Aviation Organization (ICAO) Headquarters from 10 to 13 July 2017.

1.1.2 The meeting was opened at 0930 hours on Monday 10 July 2017.

1.2 Chair and Secretariat

1.2.1 Bill Maynard (Deputy-rapporteur of the WG-MIE and Vice-chair of the METP), acted as the chairperson at the meeting.

1.2.2 Sue O'Rourke (Rapporteur of the WG-MIE) acted as the secretariat for the meeting with assistance from Neil Halsey and Raul Romero (ICAO Secretariats).

1.3 Attendance

1.3.1 The list of participants is given in Appendix A.

1.4 Meeting Purpose

1.4.1 The purpose of the meeting was to progress the work of the WG-MIE, whose objective is to ensure the smooth transition to the provision and exchange of MET information in ICAO Meteorological Information Exchange Model (IWXXM) form and into the System Wide Information Management (SWIM) environment.

1.5 Papers

1.5.1 A total of twenty-five (25) Study Notes (SN), ten (10) Information Papers (IP) and two (2) presentations were tabled at the meeting. A list of these are given in Appendix B.

1.6 Adoption of Agenda and Working Arrangements

1.6.1 The meeting adopted the agenda (refer *SN01 – Provisional Agenda*) and noted the working arrangements for the meeting (refer *IP01 – Arrangements for the Meeting*).

1.7 Minutes from the Previous Meeting

1.7.1 The minutes from the previous meeting (refer *SN02 – WG-MIE Minutes from June WebEx*) held via WebEx on 7 June 2017 were accepted and considered as final. All actions were closed with the exception of the SI Units and IWXXM Questionnaire actions which will be integrated into the Work Plan.

1.8 Work Plan

1.8.1 The Work Plan (refer *SN03 – WG-MIE Work Plan*) and associated Job Cards (refer *IP05 – Job Card METP.004* and *IP06 – Job Card CP-DCIWG.008*) were tabled and were reviewed as part of Action Item 9.

Agenda Item 2: Work Stream 1 – IWXXM Requirements

2.1 IWXXM Requirements

2.1.1 Patrick Simon (Coordinator of WS1) summarised the status of the activities relating to WS1 – IWXXM Requirements (refer *SN04 – Work Stream 1 – IWXXM Requirements Status Report)*.

2.1.2 It was noted that an IWXXM Implementation Workshop (ICAO APAC and WMO) is scheduled to be held in Hong Kong, China from 10-12 October 2017.

2.2 IWXXM Validation

2.2.1 The group discussed the validation of IWXXM at the Secure Aviation Data Information Service (SADIS) and World Area Forecast System (WAFS) Internet File Service (WIFS) Gateways and at the Regional Operational Meteorology (OPMET) Data Banks (RODBs) and Regional Operations Centres (ROCs) (refer *SN07 – IWXXM Validation by the SADIS & WIFS Gateway Providers* and *SN08 – IWXXM Statistics to be Provided by the ROCs and RODBs*).

2.2.2 The SADIS/WIFS Gateways provides availability statistics on OPMET, i.e., Traditional Alphanumeric Code (TAC) information which is reported to the METP Working Group on Meteorological Operations (WG-MOG). The group felt this was useful as it provided a global set of information that should be extended to include statistics for IWXXM. However it should be noted that the World Area Forecast Centres (WAFC) only collect and redistribute OPMET data and are not the originator of the majority of the information.

2.2.3 Some ROCs/RODBs provide a larger set of statistics. These statistics are reviewed by the relevant Planning and Implementation Regional Groups (PIRG) who establish action plans to correct any issues associated with the format and dissemination of this OPMET data. It is important that this process is maintained for the IWXXM form of the information and the statistics captured to include IWXXM validation.

2.2.4 The statistics on IWXXM OPMET suggested to be provided by the ROCs/RODBs is given in SN08. It was agreed that this information could be provided as an appendix to the *Guidelines for the Implementation of OPMET data exchange using IWXXM*. As part of its ongoing work the group should also consider what information should reside in other documents such as Annex 3, the planned PANS-MET, Doc. 10003 and any other guidance documentation.

2.2.5 The group formulated the following Actions related to IWXXM statistics:

Action MIE/3-01: IWXXM Statistics – SADIS/WIFS
That the WG-MIE invite the WG-MOG to:

a) ask the SADIS and WIFS Providers to establish procedures to compute and make available the statistics relating to the availability of IWXXM data on their respective systems, ideally at least twice yearly (as given below, also refer SN07); and
b) provide the WG-MIE and the PIRGs the statistics.

Data Volumes

- Daily message volumes in bytes, broken down into daily and monthly totals per OPMET type for each ICAO region and State.

Non-Scheduled OPMET Headers

- Quantity of each non-scheduled OPMET type (e.g. AIRMET, SIGMET, VAA, TCA);
- Provided during the agreed monitoring period, provided by ICAO region, State and location;
- Version/s of IWXXM schema for each non-scheduled OPMET type exchanged by region and State.

Alignment of Routine OPMET Content

- Availability of each required Routine OPMET type (Refer Note 1) as a percentage by ICAO region, state and station;
- Station deficiencies lists;
- Version/s of IWXXM schema for each routine OPMET type by State and region.

Note: For Routine OPMET (i.e. METAR and TAF), it should be noted that the eANP only requires data from AOP aerodromes. However, it is desirable that statistics also be provided on the non-AOP aerodromes that States have agreed to exchange. Statistics should clearly distinguish AOP and non-AOP aerodromes.

Action MIE/3-02: IWXXM Validation Statistics – ROCs/RODBs
That the WG-MIE further develop the *Guidelines for IWXXM validation statistics to be gathered by ROCs and RODBs* (as given in SN08) and merge this with the *Guidelines for the implementation of OPMET data exchange using IWXXM*.

2.3 Translation Centres

2.3.1 The group discussed the concept of a Translation Centre for IWXXM (refer *SN09 – IWXXM Translation Centre Operations*).

2.3.2 Ideally the group did not consider that a separate Translation Centre would be required. Instead translation could be a function performed by an existing centre such as a ROC or RODB. The Translation Centre function was agreed to be an interim solution to support States which do not generate IWXXM and instead rely upon translating TAC to IWXXM. In the future the IWXXM should be generated at the source.

2.3.3 The group formulated the following Action related to the operation of Translation Centres:

Action MIE/3-03: Translation Centres
That the WG-MIE continue developing the *Guidelines for Translation Centre Operations* document (as given in SN09), and develop a draft Letter of Agreement for inclusion as an Appendix to the existing document *Guidelines for the Implementation of OPMET data exchange using IWXXM*.

2.4 Partially Translated Messages

2.4.1 The group discussed what process should be followed for partially translated IWXXM messages (refer *SN10 – Partially Translated Messages from TAC to IWXXM*).

2.4.2 The group formulated the following Actions related to the operation of partially translated messages:

Action MIE/3-04: Partially Translated Messages

That, given that the agreed minimum set of information to be present to allow a translation (refer SN10) is:

METAR: METAR (*COR*) CCCC YYGGggZ
TAF: TAF (*COR/AMD*) CCCC YYGGggZ
SIGMET/AIRMET: CCCC SIGMET | AIRMET ... VALID YYGGgg/YYGGgg
VAA: DTG, VAAC
TCA: DTG, TCAC
where " | " indicates a logical "OR", "(group)" indicates an optional group

that the WG-MIE request that WMO can provide an IWXXM schema version allowing the use of particular dedicated tags with the indication of NIL, even for Annex 3 mandatory MET elements, and indication of the incoming TAC with specific tags when translation fails.

Action MIE/3-05: Partially Translated Messages
That the WG-MIE further investigate if a policy related to partially translated messages from TAC to IWXXM should still be applied after the Annex 3 Amendment 78 applicability date for IWXXM data.

2.5 IWXXM Messages

2.5.1 The group discussed the IWXXM requirements for the upcoming Space Weather Advisory message and the existing Significant Weather (SIGWX) product (refer *IP08.rev – Space Weather Advisory* and *SN26 –Translation of Significant Weather Objects to XML*).

2.5.2 The Space Weather provisions developed by the METP Working Group on Meteorological Information and Service Development (WG-MISD) were presented at the last METP meeting and were subsequently approved by the Air Navigation Commission (ANC). The State Letter relating to this was sent to States for comments prior to 7 July 2017. The Space Weather Advisory template was modelled after the VAA/TCA templates. After liaison with the WG-MIE and WMO's Task Team on Aviation XML (TT-AvXML) there were some questions regarding the translation of the Space Weather Advisory TAC message to IWXXM that required some minor amendments. The meeting noted that the information in second revision of IP08.rev addressed the concerns of the WG-MIE.

2.5.3 The WAFCs have delayed upgrading from BUFR Edition 3 to Edition 4 as they are anticipating a switch to Extensible Markup Language (XML). This delay is intended to keep the users from having to switch BUFR formats, and then switch again to XML. However, there are risks involved in continuing to use an outdated and unsupported code standard. WAFC Washington has developed preliminary XML code for SIGWX objects, but WMO will not review and officially approve it without a formal requirement from ICAO.

2.5.4 The group formulated the following Actions related to IWXXM for SIGWX messages:

Action MIE/3-06: IWXXM SARPs for SIGWX
That the WG-MIE develop draft IWXXM standards and recommended practices (SARPs) for Annex 3 Amendment 79 for SIGWX, for consideration by the METP.

Action MIE/3-07: IWXXM Schema for SIGWX
That the WG-MIE request WMO to develop, in conjunction with the WAFCs, a schema to translate SIGWX objects of jetstreams, turbulence, cumulonimbus cloud, icing, tropopause heights, active volcano location and tropical cyclone and other objects/elements as identified, to IWXXM.

Action MIE/3-08: IWXXM data representation of SIGWX elements
That the WG-MIE, in conjunction with WMO, investigate how we could represent the elements/information currently within a SIGWX in IWXXM form, which can then be visualised (text and graphic) downstream (ie. starting with data/XML and deriving human-readable products from the data – rather than the other way around).

2.6 IWXXM Workshops

2.6.1 The group reviewed the outcomes from the IWXXM Implementation Workshop which was held in Paris, France from 17-18 May 2017 (refer *IP07 – Outcome from the EUR ICAO IWXXM Workshop*).

2.7 TT-AvXML Activities

2.7.1 The group discussed the activities of the TT-AvXML and the development of IWXXM 3.0 (refer *SN05 – TT-AvXML – Activities Update* and *SN06 – IWXXM 3.0 and Beyond*).

2.7.2 There is a formal procedure within WMO for IWXXM schema version approvals which includes how to handle schema versions inter-session. The tentative schedule for IWXXM 3.1 is May 2019, with development, testing and approvals prior to this date.

2.7.3 TAC and IWXXM are currently kept as similar as possible. However as we move into a data-centric environment the IWXXM form could be used to provide more information without having the restrictions of the TAC form. The METP agreed that the TAC form will be frozen unless there is a safety case presented (METP2 recommendation 8/1). This allows us to define the information required for IWXXM, such as the specific MET information and their associated resolution/quality that is required for both observations and forecasts. With the IWXXM information acting as the 'super-set' of data, there may still be a need to look at standard approaches to the visualisation (both text and graphic) of the data for specific uses. Many State regulations have been built around the TAC, so we need to provide information to the aviation industry to enable the regulations to change and include any additional MET information if required. The group also discussed the structure of IWXXM and whether the format should be tightly restrained or more flexible. It was agreed that there needs to be a balance between uniformity (strong-type) and flexibility (weak-type).

2.7.4 In the case of aerodrome observations, an IWXXM METAR is produced from the TAC message, however a more flexible version of aerodrome observational data in IWXXM form is required, enabling greater compatibility in a SWIM environment. It was agreed that we need to establish what meteorological observations may look like in the SWIM-environment, particularly with the Aviation System Block Upgrades (ASBU) Block 1 timeframes fast approaching. It was agreed that the group needed to focus on data-centric, rather than product-centric, IWXXM in the future.

2.7.5 It was agreed that there is a need to transition from a push (Aeronautical Fixed Telecommunication Network (AFTN)) to a pull (SWIM) environment and transition from TAC to TAC/IWXXM to IWXXM/human-readable, keeping in mind that there is already a lot of investment into preparing for Annex 3, Amendment 78 and the standardisation of IWXXM. It is essential that developing countries be considered when proposing any SARPs and that any proposals are also easily understood by all States.

2.7.6 The group discussed how web-based development platforms should be used to integrate developer feedback. The WMO TT-AvXML will investigate the use of web-based platforms like GitHub and GitLab and provide additional information back to the WG-MIE to consider.

2.7.7 The group discussed whether ICAO and WMO should standardize translation methods from XML and TAC (or TAC-like) products. It was considered that the WG-MIE, in conjunction with the other METP WGs, could look at a range of best-practice human-readable text and graphic products that could be derived from IWXXM XML/GML. In advancing this consideration needs to be given to how long we maintain the current forms of the TAC.

2.7.8 The group discussed whether a change to the AIRMET and SIGMET templates for TAC was required, and subsequently IWXXM, to allow more than two VA/TC polygons. It was again noted that the METP/2 agreed to a TAC freeze and so any changes to TAC require a safety case and to go to WG-MRI for consideration. The group agreed that any extension of multiple VA/TC regions, or any other hazardous phenomena, could be handled by the IWXXM and would be a good incentive for a more rapid change to the IWXXM form of meteorological information.

2.9.9 The group discussed whether sequence numbers are appropriate for TAF and other ICAO Annex 3 products to allow for unique identification. Given that only one TAF for a specific location can be valid at any one time (ie. the last time-stamped version is the valid one) and the fact that in a TAF there is provision for COR or AMD, the group decided that a sequence number was not required in a TAF.

2.7.10 The group formulated the following Decision and Actions related to TT-AvXML Activities:

Decision MIE/3-01: Con-joint WG-MIE and TT-AvXML Meetings
That the WG-MIE hold con-joint meetings, where possible with the WMO TT-AvXML.

Action MIE/3-09: IWXXM Timeline of Events
That the WG-MIE develop a timeline of events to look at the activities and associated timeframes related to the development of schema and documentation related to IWXXM, both within WMO and ICAO.

Action MIE/3-10: IWXXM benefits
That the WG-MIE identify the areas where IWXXM can be of greatest benefit and identify the limitations of the existing TAC messages.

Action MIE/3-11: Missing parameters in METAR
That the WG-MIE invite the WMO to implement support for missing/incorrect mandatory meteorological parameters within the METAR within IWXXM 3.0 to ensure that the other parameters are still available and that it doesn't fail validation once translated into IWXXM.

Action MIE/3-12: Missing parameters in METAR
Propose an update to Annex 3, amendment 79, and related guidance material, to provide information on how to deal with missing/incorrect mandatory meteorological parameters within the METAR to ensure that the other parameters are still available and that it doesn't fail validation once translated into IWXXM.

Action MIE/3-13: Translation from XML to TAC

That the WG-MIE consider whether formal and standard translation mechanisms (during the time where TAC and IWXXM co-exist) from XML to TAC should be developed by ICAO and WMO and made available to aeronautical stakeholders.

Action MIE/3-14: TAC elements difficult to translate
That the WG-MIE identify the elements or descriptions of elements within TAC that are not easily translated to XML and, after considering the needs of the users (through the WG-Meteorological Requirements and Integration (MRI)), whether these should be removed from Annex 3.

Agenda Item 3: Work Stream 2 – Future IWXXM Requirements

3.1 Future IWXXM Requirements

3.1.1 Pat Murphy (Coordinator of WS2) summarised the status of the activities relating to WS2 – Future IWXXM Requirements (refer *SN11 – Work Stream 2 – Future IWXXM Requirements Report)*.

3.2 Status Indicators

3.2.1 The group discussed the requirement for additional operational status indicators for the IWXXM representation of meteorological information (refer *SN12 – Additional Operational Status Indicators*).

3.2.2 The group formulated the following Decision related to the requirement for additional operational status indicators:

Decision MIE/3-02: Additional IWXXM status indicators
That the current OPERATIONAL and NON-OPERATIONAL IWXXM indicators, including the TEST and EXERCISE sub-categories, remain sufficient for all expected scenarios, and that no additional indicators are required.

3.3 Separation of TAC and IWXXM

3.3.1 The group discussed the requirement to commence the separation of the TAC and IWXXM code forms (refer *SN13 – Consider a Clear Separation Between TAC and IWXXM*). It was agreed that, to make the best use of IWXXM, it should be able to be further developed and be able to contain additional information than the restrictive TAC form. An example is that the METAR/SPECI describes the surface observation at an aerodrome, however there is a need for some users to have observations available at multiple locations across an aerodrome and/or at a higher reporting frequency. So a first step may be to look at which meteorological elements/information are currently required and expand on these as necessary (rather than focussing on the TAC elements). This information should then be made available in Annex 3 and the means of compliance could be given in future PANS-MET. IWXXM would be generated at source, providing more information than the existing TAC. We also need to consider the timeframe for which IWXXM can contain more information than the TAC. A suggestion would be to do this from November 2020.

3.3.2 The group formulated the following Action related to the separation of TAC and IWXXM:

Action MIE/3-15: IWXXM and TAC
That WG-MIE consider further actions to start the separation of the link between TAC and IWXXM that inhibits the evolution of IWXXM, particularly taking into account the transition to SWIM.

3.4 IWXXM Schema

3.4.1 The group discussed the issues relating to the development of the IWXXM schema (refer *SN14 – IWXXM elements to be considered by ICAO, to be communicated to WMO*). It needs to be clear as to which version of the IWXXM schema can be used operationally, and that the release candidates (ie RCxx) are to be used for evaluation/testing and cannot be used operationally. The group agreed that it would be advantageous to document the procedure on how modifications to the IWXXM schema are to

be processed and a clear policy on which IWXXM version/s can be used operationally and within what general timeframe.

3.4.2 The group also discussed the need to better define meteorological zones/areas within products such as the SIGMET. It was also agreed that WMO guidance on IWXXM schema elements for COLLECT schema would be useful (e.g. a IWXXM SIGMET message is to be encapsulated within a collect).

3.4.3 The group formulated the following Actions related to IWXXM schema:

Action MIE/3-16: IWXXM Schema Versions
That the WG-MIE invite the WMO to consider defining and documenting a policy on IWXXM schema versioning that would clearly differentiate which versions are to be used for evaluation and which versions can be used operationally to support specific Annex3 amendments.

Action MIE/3- 17: Meteorological Zones/Areas described by SIGMET information
That the WG-MIE, in coordination with the WMO, consider the need for defining zones/areas affected by meteorological phenomena as described in SIGMET, as an intersection between a polygon (meteorological phenomenon) and an external reference to an airspace (ie. FIR) in cases where the meteorological phenomenon exceeds the airspace boundary.

Action MIE/3-18: Collect Schema
That the WG-MIE invite the WMO to document that the collect schema is mandatory even for a single IWXXM message.

Agenda Item 4: Work Stream 3 - SWIM Plan

4.1 MET-SWIM Plan & Roadmap

4.1.1 Aaron Braeckel (Coordinator of WS3) led the discussion on the draft MET-SWIM Roadmap (refer *SN16 – Plan for Meteorology in System Wide Information Management (SWIM)*) which is designed to supplement *Doc. 10039 - Manual of System Wide Information Management* and *Doc. 10003 – Manual on the Digital Exchange of Aeronautical Meteorological Information*. The MET-SWIM Plan provides further detail on the exchange of aeronautical meteorological information within SWIM. There are several data exchange types in the MET-SWIM environment, including gridded data, non-gridded data and images. Standardized protocols and data formats are crucial to enable effective data distribution. Several technical standards (e.g. Open Geospatial Consortium (OGC) Web Mapping Service (WMS), Web Coverage Service (WCS) and Web Feature Service (WFS)) already exist that may meet the MET-SWIM requirements. The group also discussed the draft MET-SWIM Roadmap (refer *SN17 – Roadmap for Meteorology in System Wide Information Management (SWIM)*).

4.1.2 The Information Management Panel (IMP) is undertaking a major review of Doc.10039. Coordination with the IMP is required to look at which aspects of MET in SWIM (ie. the common governance and quality issues) could be part of Doc.10039 or it's appendices and which should be in a stand-alone MET document. The review of Vol 1 of Doc.10039 is scheduled for the end of 2017 and Vol 2 by April 2018. The WG-MIE needs to continue developing the MET-SWIM Plan, initially as an internal document, with a view to integrating parts into Doc.10039 and then having the more domain specific content (i.e. MET) as a separate document that can eventually be shared with the wider aviation community. To achieve this we need to be clear as to the aim of the MET-SWIM Plan. Is it for us to develop MET-SWIM or is it for the aviation user and service provider community to understand what MET-SWIM is, or both?

4.1.3 SWIM is a complete change in culture and services that will evolve over time. We need to be clear on what MET services need to be provided in a SWIM environment, how we will use SWIM to disseminate MET information and what is needed to provide SWIM services.

4.1.4 It is important to look at how the current MET service will transition to a SWIM environment. The MET-SWIM Roadmap would be the best mechanism to articulate this. The *Manual on Flight and Flow – Information for a Collaborative Environment (FF-ICE)* (Doc. 9965) dedicates a whole chapter to the transition which can be used as an example transition plan. The MET-SWIM Roadmap could provide more detail on how to transition from the dissemination of meteorological information (in TAC form) via AFTN, to the provision of information in IWXXM form (derived from TAC) over the Air Traffic Services (ATS) Message Handling System (AMHS), to the SWIM environment via Internet Protocol (IP) where the data is provided directly into SWIM and where data can be extracted from this to be available directly into systems or to use to derive human-readable products.

4.1.5 Other areas that need to be addressed include: the roles of the ROC/RODB in the SWIM environment and the architecture required to deliver services within a SWIM environment.

4.1.6 The group formulated the following Actions related to the MET-SWIM Plan and Roadmap:

Action MIE/3-19: MET-SWIM Plan and Roadmap
That the WG-MIE continue to develop the MET-SWIM Plan and Roadmap (initially for use internally by the WG-MIE) in conjunction with the IMP, taking into account the update of

Doc.10039, and considering the content, evolution, distribution and timeframe consider the need to look at what can be published as Guidance or an official Doc in the future.

Action MIE/3-20: WG-MIE Workshop
That the WG-MIE hold a short workshop, in conjunction with the next face-to-face meeting, to brainstorm issues relating to IWXXM and MET-SWIM.

4.2 MET-SWIM Issues

4.2.1 The group discussed the issues relating to the integration of MET into a SWIM environment (refer *SN18 – MET-SWIM Open Topics* and *SN27 – MET-SWIM Issues*).

4.2.2 The group discussed the role of AMHS for SWIM. While AMHS won't necessarily be used for SWIM, the AMHS is via IP and the use of this technology may help in the transition to SWIM (as AFTN will not be suitable).

4.2.3 The timelines for the transition to SWIM were discussed including the old and new ASBU module timeframes and the Annex update schedule. It was noted that SWIM and AMET (in a SWIM environment) was due to commence during ASBU Block 1 (ie. from 2019 – over a 6 year period) and that any SWIM SARPs were not likely before 2020. Other ASBU Blocks are scheduled as follows: Block 2 from 2025, Block 3 from 2031. Note Block 4 from 2037, is likely to be added in the next GANP. Discussion between the WG-MRI and the WG-MIE needs to be held to determine the MET-SWIM timelines as these will be driven by requirements.

4.2.4 Full SWIM services won't be available in 2020, when IWXXM becomes a standard. Implementation of the AMHS typically utilises an underlying IP network. When implementing these IP networks, States should consider supporting the operation of future services such as SWIM.

4.2.5 The group discussed how long we were likely to have TAC given the current freeze on the code form. While it is likely that we will be looking at supplying meteorological information in the form of phenomenon or meteorological elements in the future, it is still likely that there will be a requirement for visualisation (text/graphic) to be derived from this data. The type of data and resolution should be discussed with WG-MRI.

4.2.6 The group formulated the following Action related to the MET-SWIM:

Action MIE3/21: MET-SWIM Timelines
That the WG-MIE, in conjunction with the WG-MRI, determine the MET-SWIM timelines.

Action MIE3/22: TCP/IP Networks and SWIM
That the WG-MIE invite the Communications Panel (CP) and Information Management Panel (IMP) to provide assurance that the TCP/IP networks being installed today can be used in the SWIM environment in the future (during ASBU Block 1). Noting that individual members/advisors of the WG-MIE could also discuss this at the State level.

Action MIE/3-23: Long-term policy on XML, gridded data, and other forms of aeronautical meteorology data
That the WG-MIE, in conjunction with the WG-MRI, formalize a set of policies for review by the broader METP regarding XML, gridded data, TAC, and other official aeronautical meteorology representations, including details of the set of MET-SWIM supported representations (TAC,

XML, gridded data, imagery, and others), intended purposes of each representation, requirements and mechanisms for translation between and among these representations, and a timeline for the introduction and retirement of each representation. As a precursor, an analysis of the foreseen future needs for ICAO provisions on data and display formats from a MET perspective will be performed.

Action MIE/3-24: High-fidelity MET information for SWIM
That the WG-MIE discuss with the WG-MRI what requirement there are for high-fidelity MET data for SWIM (i.e, the full precision, original observed or forecast values, and data sets before aggregation) without categorical binning or other human-readable derivations being applied.

Action MIE/3-25: MET data dissemination architecture
That WG-MIE investigate data dissemination architecture, including consolidated or federated models.

Action MIE/3-26: List of MET information to be provided under SWIM
That WG-MIE, in conjunction with WG-MRI, develop a list of MET information and MET producers required under a SWIM environment.

4.2.7 The group considered a number of questions that were raised in *SN27 – MET-SWIM Issues:*

- How will incomplete implementation of MET data within the SWIM environment be handled?
- Could the OPMET databanks be used as data repositories or some kind of SWIM service centre?
- Do we want MET information to have a unique solution which is approved by the State?
- Are there any sources of MET information that could be provided as long as they are labelled as not being the State approved value?
- How can the use of aviation-funded MET data by commercial non-aviation related activities be mitigated?

4.2.8 It was agreed that there was a need to look at procedures/policies regarding who are authoritative sources as there could be an issue with multiple sources of information for similar types of data. It was noted that each State would ultimately need to look at what information must be used in a regulatory environment.

4.2.9 There was also considered to be a need to look at whether the data can be made available to non-aviation users. If the answer is yes (or yes in part) then there would also need to be consideration on how costs could be recovered. In registering as a user there may be ways that SWIM can deal with this, ie. if you are an aviation user then access can be granted or otherwise fees may apply. The WG-MOG is looking at the SADIS cost recovery and approval process and the Working Group on Meteorological Cost Recovery Guidance and Governance (WG-MCRGG) is looking at the general cost recovery issue.

4.2.10 The group formulated the following Actions related to data provision in a SWIM environment:

Action MIE/3-27: RODB and ROC functions
That the WG-MIE investigate what functions RODBs and ROCs have in the transition to and within the SWIM environment.

Action MIE/3-28: Authoritative Sources for MET

That the WG-MIE investigate the need for the identification of authoritative sources and users with respect to meteorological information with SWIM.

Action MIE/3-29: Use of aviation MET data by non-aviation users
That the WG-MIE, in conjunction with the WG-MCRGG investigate how we could ensure that aviation MET data is exclusively used by its intended users. Noting that the Working Group - Meteorological Operations Group -Secure Aviation Data Information Service (WG-MOG-SADIS) has a similar action.

4.3 Coordination with IMP

4.3.1 The group discussed the issues relating to the coordination with the IMP (refer *SP01 – IMP-METP/WG-MIE Inter-Panel Coordination, SP02 – IMP Structure* and *IP09 – Introduction of "Information Services Concept of Operations" document from the IMP Services Working Group*).

4.3.2 Susanne Biermann-Höller and Peter Rudolph (from the IMP) have joined the WG-MIE to assist with the coordination between the two groups. They will also report back to the IMP on common issues between the two groups. The next IMP meeting will be held in November 2017. The objective is to continue the development of the SWIM Concept Manual (Doc 10039) and eventually provide a SWIM Manual. This will include concept transition, guidance, domain transition (including MET).

4.3.3 The main items that the 2 groups will coordinate and work on are:
- Ensure common application protocols
- Integrate MET information into the SWIM Manual
- IWXXM versions – to ensure correct technical details
- Domain transition from AFTN to AMHS to SWIM

4.3.4 The SWIM Manual will contain two main volumes, with the first volume containing general information regarding SWIM and the second volume containing the implementation guidance and transition details. Discussion is underway as to whether further volumes or appendices or stand-alone documents would be required for each domain (MET, Air Traffic Management (ATM) and Aeronautical Information Management (AIM)) regarding the transition to SWIM.

4.3.5 Questions remain regarding the difference between WXXM (the original weather exchange model) and IWXXM. In ICAO documentation it should be IWXXM. The ICAO secretariat has looked at this for the next edition of specific documentation.

4.3.6 When considering SWIM and looking at requirements we also need to take into account 'No country left behind' and remember that ICAO has 191 States and there is a large number of developing States.

4.3.7 The group noted *IP09 – Introduction of "Information Services Concept of Operations" document from the IMP Services Working Group* where there were 4 main categories for defining MET:
- Observed Meteorological Information Services (T0; Real-time)
- Nowcast Meteorological Information Services (T0-minutes, Minutes to 1-3hrs; Real-time to near Real-time)
- Forecast Meteorological Information Services (Minutes to 1-3hrs, Hours to days; Real-time, Near Real-time to Planning)
- Space Weather Information Services (T0-minutes, Minutes to 1-3hrs)

4.3.8 The group formulated the following Actions related to coordination with the IMP and SWIM testing:

Action MIE/3-30: IMP Coordination
That the WG-MIE coordinated with the IMP on activities relating to the development of the MET-SWIM Plan and the transition of MET into the SWIM environment.

Action MIE/3-31: MET-SWIM Testing
That members of the WG-MIE share information within the group regarding MET-SWIM testing to look at successes and failures and how any issues may be addressed.

Agenda Item 5: Work Stream 4 - IWXXM Documentation

5.1 IWXXM Documentation

5.1.1 Tim Hailes (Coordinator of WS4) summarised the status of the activities relating to WS4 – IWXXM Documentation (refer *SN20 – Work Stream 4 –IWXXM Documentation).*

5.2 Status Indicators

5.2.1 The group discussed the guidelines on the use of operational and non-operational status indicators (refer *SN21 – Guidelines on the use of Operational and Non-operational Status Indicators in IWXXM Messages*) and agreed that this information should be provided within the document *Guidelines for the Implementation of OPMET Data Exchange using IWXXM*.

5.2.2 The group formulated the following Action related to status indicators:

Action MIE/3-32: Status Indicators
That the WG-MIE merge the *Guidelines on the use of Operational and Non-operational Status Indicators in IWXXM Messages* into *Guidelines for the Implementation of OPMET Data Exchange using IWXXM*.

5.3 IWXXM Exchange Testing

5.3.1 The group discussed the guidelines for testing the exchange of IWXXM messages (refer to the document titled: *IWXXM Exchange Testing*). The aim of the information provided in this document has changed since the MIE/2 meeting and it was agreed the intent of the document should be reviewed and that any relevant information should be made available within the document *Guidelines for the Implementation of OPMET Data Exchange using IWXXM*.

5.3.2 The group formulated the following Action related to IWXXM exchange testing:

Action MIE/3-33: IWXXM Testing Document
That the WG-MIE review the *IWXXM Exchange Testing* document and merge the relevant information into *Guidelines for the Implementation of OPMET Data Exchange using IWXXM*.

5.4 Annex 3 – AMHS and IWXXM

5.4.1 The group discussed the proposed amendments to Annex 3 relating to AMHS and IWXXM (refer *SN23 – IWXXM and AMHS requirements in Annex 3*). It was agreed that a more general statement relating to AFS (rather than AFTN or AMHS) should be included in Annex 3.

5.4.2 The group formulated the following Action related to the reference to AMHS in Annex 3:

Action MIE/3-34: AFTN references in Annex 3
That the WG-MIE look at the changes required to Annex 3 relating to AFTN, particularly in Appendix 10 and consider replacing them with AFS.

5.5 IWXXM Transition

5.5.1 The group discussed the proposed guidelines for IWXXM Transition (refer *SN28 – Guidelines for IWXXM Transition*). It was noted that the terminology 'service orientated' should be removed from the document so that there is no confusion with the SWIM service oriented services, noting that the IMP is working on controlled vocabulary which might be useful for WG-MIE.

5.5.2 The group formulated the following Action related to AMHS Profile:

Action MIE/3-35: AMHS Profile
That the WG-MIE review the *AMHS Profile* document and merge the relevant information into *Guidelines for the Implementation of OPMET Data Exchange using IWXXM*.

Agenda Item 6: Work Stream 5 – Support & Coordination

6.1 Support & Coordination

6.1.1 Bill Maynard (Coordinator of WS5) summarised the status of the activities relating to WS5 – Support & Coordination (refer *SN24 – Work Stream 5 –Work Stream 5 – Status Report)*.

6.1.2 With reference to the Communications Panel (CP) Job Card CP-DCIWG.008, it was agreed that WG-MIE members and advisors should report on any IWXXM testing being conducted. This would allow us to share successes and failures and look at how others solved any problems. This could also be shared with the CP.

6.1.3 The group formulated the following Action related to IWXXM testing:

Action MIE/3-36: IWXXM Testing
That members of the WG-MIE share information within the group regarding IWXXM testing to look at successes and failures and how any issues may be addressed.

6.2 Change Configuration Board

6.2.1 The group discussed the proposal for a Change Configuration Board (CCB) (refer *SN25 – Change Configuration Board for IWXXM*). The group felt that a formal CCB was probably not necessary as there is already a good working relationship between the WMO and ICAO as well as a means to ensure that the provisions in WMO No.49 Technical Regulations and Annex 3 SARPs are consistent, noting that the working arrangements between ICAO and WMO (refer to Doc.7475 – *Working Arrangements between the International Civil Aviation Organization and the World Meteorological Organization*) are in the process of being updated. However there are concepts relating to the CCB that should be considered as best practice that the group could adopt. It was felt that wider participation in WG-MIE was required, particularly from users of IWXXM and the future users of SWIM. It was, therefore, considered necessary to conduct a gap analysis to look at where the change process may be improved to facilitate better transparency and inclusiveness.

6.2.2 The group formulated the following Actions related to the working arrangements between WG-MIE and TT-AvXML and the change process:

Action MIE/3-37: TT-XML/WG-MIE Working Arrangements
That the WG-MIE, in conjunction with the WMO, document the working arrangements between WMO TT-AvXML and ICAO METP WG-MIE.

Action MIE/3-38: IWXXM Change Process
That the WG-MIE conduct a gap analysis as to where the IWXXM change process can be improved and look how we can be more inclusive in the working of the group.

Agenda Item 7: Any other business

7.1 ICAO Documentation

7.1.1 It was pointed out that many other ICAO Annexes discuss meteorological information and with the move to the IWXXM form of this data, in addition to TAC, that a review may be needed, particularly Annex 6 – *Operation of Aircraft*, Annex 10 – *Aeronautical Telecommunications*, Annex 11 – *Air Traffic Services*, Annex 15 – *Aeronautical Information Services*) and ICAO Doc.9377 – *Manual on Coordination between Air Traffic Services, Aeronautical Information Services and Aeronautical Meteorological Services*, to reflect the inclusion of meteorological information in IWXXM form.

7.1.2 The group formulated the following Action related to ICAO Annex and Document updates:

Action MIE/3-39: ICAO Annex and Doc updates
That the WG-MIE investigate which other Annexes (ie Annex 6, 10, 11, 15) and ICAO documents (i.e. Doc.9377) need to be updated to reflect the introduction of meteorological information in IWXXM form.

7.2 WG-MIE Coordination

7.2.1 Various ongoing tasks are required by the 'Support and Coordination' work stream, namely: updating the calendar of events, the work plan, proposals for the updates to the Job Card and minutes of the meetings. It was agreed that these activities could be carried forward by the rapporteurs and the ICAO Secretariat as part of their normal work.

Agenda Item 8: Agreed Actions and Decisions

DECISIONS:

Decision MIE/3-01: Con-joint WG-MIE and TT-AvXML Meetings (refer Activity 4.4)
That the WG-MIE hold con-joint meetings, where possible with the WMO TT-AvXML.

Decision MIE/3-02: Additional IWXXM status indicators
That the current OPERATIONAL and NON-OPERATIONAL IWXXM indicators, including the TEST and EXERCISE sub-categories, remain sufficient for all expected scenarios, and that no additional indicators are required.

ACTIONS:

Action MIE/3-01: IWXXM Statistics – SADIS/WIFS (refer Activity 4.7)
That the WG-MIE invite the WG-MOG to:

a) ask the SADIS and WIFS Providers to establish procedures to compute and make available the statistics relating to the availability of IWXXM data on their respective systems, ideally at least twice yearly (as given below, also refer SN07); and
b) provide the WG-MIE and the Planning and Implementation Regional Groups (PIRGs) the statistics.

Data Volumes

- Daily message volumes in bytes, broken down into daily and monthly totals per OPMET type for each ICAO region and State.

Non-Scheduled OPMET Headers

- Quantity of each non-scheduled OPMET type (e.g. AIRMET, SIGMET, VAA, TCA);
- Provided during the agreed monitoring period, provided by ICAO region, State and location;
- Version/s of IWXXM schema for each non-scheduled OPMET type exchanged by region and State and region.

Alignment of Routine OPMET Content

- Availability of each required Routine OPMET type (Refer Note 1) as a percentage by ICAO region, state and station;
- Station deficiencies lists;
- Version/s of IWXXM schema for each routine OPMET type by State and region.

Note: For Routine OPMET (i.e. METAR and TAF), it should be noted that the eANP only requires data from AOP aerodromes. However, it is desirable that statistics also be provided on the non-AOP aerodromes that States have agreed to exchange. Statistics should clearly distinguish AOP and non-AOP aerodromes.

Action MIE/3-02: IWXXM Validation Statistics – ROCs/RODBs (refer Activity 3.6)
That the WG-MIE further develop the *Guidelines for IWXXM Validation Statistics to be Gathered by ROCs and RODBs* (as given in SN08) and merge this with the *Guidelines for the Implementation of OPMET data exchange using IWXXM*.

Action MIE/3-03: Translation Centres (refer Activity 3.7)

That the WG-MIE continue developing the *Guidelines for Translation Centre Operations* document (as given in SN09), and develop a draft Letter of Agreement for inclusion as an Appendix to the existing document *Guidelines for the Implementation of OPMET data exchange using IWXXM*.

Action MIE/3-04: Partially Translated Messages (refer Activity 4.8)
That, given that the agreed minimum set of information to be present to allow a translation (refer SN10) is:

METAR: METAR (*COR*) CCCC YYGGggZ
TAF: TAF (*COR/AMD*) CCCC YYGGggZ
SIGMET/AIRMET: CCCC SIGMET | AIRMET ... VALID YYGGgg/YYGGgg
VAA: DTG, VAAC
TCA: DTG, TCAC
where " | " indicates a logical "OR", "(group)" indicates an optional group

that the WG-MIE request that WMO can provide an IWXXM schema version allowing the use of particular dedicated tags with the indication of NIL, even for Annex 3 mandatory MET elements, and indication of the incoming TAC with specific tags when translation fails.

Action MIE/3-05: Partially Translated Messages (refer Activity 1.6)
That the WG-MIE further investigate if a policy related to partially translated messages from TAC to IWXXM should still be applied after the Annex 3 Amendment 78 applicability date for IWXXM data.

Action MIE/3-06: IWXXM SARPs for SIGWX (refer Activity 1.7)
That the WG-MIE develop draft IWXXM standards and recommended practices (SARPs) for Annex 3 Amendment 79 for SIGWX, for consideration by the METP.

Action MIE/3-07: IWXXM Schema for SIGWX (refer Activity 4.9)
That the WG-MIE request WMO to develop, in conjunction with the WAFCs, a schema to translate SIGWX objects of jetstreams, turbulence, convective cloud, icing, tropopause heights, active volcano location and tropical cyclone and other objects/elements as identified, to IWXXM.

Action MIE/3-08: IWXXM data representation of SIGWX elements (refer Activity 1.8)
That the WG-MIE, in conjunction with WMO, investigate how we could represent the elements/information currently within a SIGWX in IWXXM form, which can then be visualised (text and graphic) downstream (ie. starting with data/XML and deriving human-readable products from the data – rather than the other way around).

Action MIE/3-09: IWXXM Timeline of Events (refer Activity 4.10)
That the WG-MIE develop a timeline of events to look at the activities and associated timeframes related to the development of schema and documentation related to IWXXM, both within WMO and ICAO.

Action MIE/3-10: IWXXM benefits (refer Activity 1.9)
That the WG-MIE identify the areas where IWXXM can be of greatest benefit and identify the limitations of the existing TAC messages.

Action MIE/3-11: Missing parameters in METAR (refer Activity 4.11)
That the WG-MIE invite the WMO to implement support for missing/incorrect mandatory meteorological parameters within the METAR within IWXXM 3.0 to ensure that the other parameters are still available and that it doesn't fail validation once translated into IWXXM.

Action MIE/3-12: Missing parameters in METAR (refer Activity 1.10)

Propose an update to Annex 3, amendment 79, and related guidance material, to provide information on how to deal with missing/incorrect mandatory meteorological parameters within the METAR to ensure that the other parameters are still available and that it doesn't fail validation once translated into IWXXM.

Action MIE/3-13: Translation from XML to TAC (refer Activity 1.11)
That the WG-MIE consider whether formal and standard translation mechanisms (during the time where TAC and IWXXM co-exist) from Extensible Markup Language (XML) to TAC should be developed by ICAO and WMO and made available to aeronautical stakeholders.

Action MIE/3-14: TAC elements difficult to translate (refer Activity 1.12)
That the WG-MIE identify the elements or descriptions of elements within TAC that are not easily translated to XML and, after considering the needs of the users (through the WG-Meteorological Requirements and Integration (MRI)), whether these should be removed from Annex 3.

Action MIE/3-15: IWXXM and TAC (refer Activity 1.13)
That WG-MIE consider further actions to start the separation of the link between TAC and IWXXM that inhibits the evolution of IWXXM, particularly taking into account the transition to SWIM.

Action MIE/3-16: IWXXM Schema Versions (refer Activity 4.12)
That the WG-MIE invite the WMO to consider defining and documenting a policy on IWXXM schema versioning that would clearly differentiate which versions are to be used for evaluation and which versions can be used operationally to support specific Annex3 amendments.

Action MIE/3- 17: Meteorological Zones/Areas described by SIGMET information (refer Activity 1.14)
That the WG-MIE, in coordination with the WMO, consider the need for defining zones/areas affected by meteorological phenomena as described in SIGMET, as an intersection between a polygon (meteorological phenomenon) and an external reference to an airspace (ie. FIR) in cases where the meteorological phenomenon exceeds the airspace boundary.

Action MIE/3-18: Collect Schema (refer Activity 4.13)
That the WG-MIE invite the WMO to document that the collect schema is mandatory even for a single IWXXM message.

Action MIE/3-19: MET-SWIM Plan and Roadmap (refer Activity 2.1)
That the WG-MIE continue to develop the MET-SWIM Plan and Roadmap (initially for use internally by the WG-MIE) in conjunction with the IMP, taking into account the update of Doc.10039, and considering the content, evolution, distribution and timeframe consider the need to look at what can be published as Guidance or an official Doc in the future.

Action MIE/3-20: WG-MIE Workshop (refer Activity 4.14)
That the WG-MIE hold a short workshop, in conjunction with the next face-to-face meeting, to brainstorm issues relating to IWXXM and MET-SWIM.

Action MIE3/21: MET-SWIM Timelines (refer Activity 2.2)
That the WG-MIE, in conjunction with the WG-MRI, determine the MET-SWIM timelines.

Action MIE3/22: TCP/IP Networks and SWIM (refer Activity 2.4)
That the WG-MIE invite the Communications Panel (CP) and Information Management Panel (IMP) to provide assurance that the TCP/IP networks being installed today can be used in the SWIM environment

in the future (during ASBU Block 1). Noting that individual members/advisors of the WG-MIE could also discuss this at the State level.

Action MIE/3-23: Long-term policy on XML, gridded data, and other forms of aeronautical meteorology data (refer Activity 2.5)
That the WG-MIE, in conjunction with the WG-MRI, formalize a set of policies for review by the broader METP regarding XML, gridded data, TAC, and other official aeronautical meteorology representations, including details of the set of MET-SWIM supported representations (TAC, XML, gridded data, imagery, and others), intended purposes of each representation, requirements and mechanisms for translation between and among these representations, and a timeline for the introduction and retirement of each representation. As a precursor, an analysis of the foreseen future needs for ICAO provisions on data and display formats from a MET perspective will be performed.

Action MIE/3-24: High-fidelity MET information for SWIM (refer Activity 2.6)
That the WG-MIE discuss with the WG-MRI what requirement there are for high-fidelity MET data for SWIM (i.e, the full precision, original observed or forecast values, and data sets before aggregation) without categorical binning or other human-readable derivations being applied.

Action MIE/3-25: MET data dissemination architecture (refer Activity 2.7)
That WG-MIE investigate data dissemination architecture, including consolidated or federated models.

Action MIE/3-26: List of MET information to be provided under SWIM (refer Activity 2.8)
That WG-MIE, in conjunction with WG-MRI, develop a list of MET information and MET producers required under a SWIM environment.

Action MIE/3-27: RODB and ROC functions (refer Activity 2.9)
That the WG-MIE investigate what functions RODBs and ROCs have in the transition to and within the SWIM environment.

Action MIE/3-28: Authoritative Sources for MET (refer Activity 2.10)
That the WG-MIE investigate the need for the identification of authoritative sources and users with respect to meteorological information with SWIM.

Action MIE/3-29: Use of aviation MET data by non-aviation users (refer Activity 2.11)
That the WG-MIE, in conjunction with the WG-MCRGG investigate how we could ensure that aviation MET data is exclusively used by its intended users. Noting that the Working Group -Meteorological Operations Group -Secure Aviation Data Information Service (WG-MOG-SADIS) has a similar action.

Action MIE/3-30: IMP Coordination (refer Activities 2.1 & 2.3)
That the WG-MIE coordinated with the IMP on activities relating to the development of the MET-SWIM Plan and the transition of MET into the SWIM environment.

Action MIE/3-31: MET-SWIM Testing (refer Activity 2.12)
That members of the WG-MIE share information within the group regarding MET-SWIM testing to look at successes and failures and how any issues may be addressed.

Action MIE/3-32: Status Indicators (refer Activity 3.8)
That the WG-MIE merge the *Guidelines on the use of Operational and Non-operational Status Indicators in IWXXM Messages* into *Guidelines for the Implementation of OPMET Data Exchange using IWXXM*.

Action MIE/3-33: IWXXM Testing Document (refer Activity 3.9)
That the WG-MIE review the *IWXXM Exchange Testing* document and merge the relevant information into *Guidelines for the Implementation of OPMET Data Exchange using IWXXM*.

Action MIE/3-34: AFTN references in Annex 3 (refer Activity 3.12)
That the WG-MIE look at the changes required to Annex 3 relating to AFTN, particularly in Appendix 10.

Action MIE/3-35: AMHS Profile (refer Activity 3.10)
That the WG-MIE review the *AMHS Profile* document and merge the relevant information into *Guidelines for the Implementation of OPMET Data Exchange using IWXXM*.

Action MIE/3-36: IWXXM Testing (refer Activity 4.3)
That members of the WG-MIE share information within the group regarding IWXXM testing to look at successes and failures and how any issues may be addressed.

Action MIE/3-37: TT-AvXML/WG-MIE Working Arrangements (refer Activity 3.11)
That the WG-MIE, in conjunction with the WMO, document the working arrangements between WMO TT-AvXML and ICAO METP WG-MIE.

Action MIE/3-38: IWXXM Change Process (refer Activity 1.15)
That the WG-MIE conduct a gap analysis as to where the IWXXM change process can be improved and look how we can be more inclusive in the working of the group.

Action MIE/3-39: ICAO Annex and Doc updates (refer Activity 3.12)
That the WG-MIE investigate which other Annexes (ie Annex 6, 10, 11, 15) and ICAO documents (i.e. Doc.9377) need to be updated to reflect the introduction of meteorological information in IWXXM form.

Action MIE/3-40: Job Card METP.004 (refer Activity 4.2)
That the WG-MIE review the METP.004 Job Card and propose an update to the METP/3 meeting.

Agenda Item 9: Work Programme Review

9.1 Job Card METP.004

9.1.1 The group reviewed the current Job Card METP.004 (refer *IP05 - Job Card METP.004*). It was observed that the current METP.004 Job Card was missing some activities from the previous version and had also not included the activities requested at the METP/2 meeting (refer to Appendix C). It was agreed that the group would take the previously agreed activities into account and propose an update to the METP/3 meeting.

Action MIE/3-40: Job Card METP.004
That the WG-MIE review the METP.004 Job Card and propose an update to the METP/3 meeting.

9.2 Job Card CP-DCIWG.008

9.2.1 The group reviewed the current Job Card DCIWG.008 (refer IP06 - *Job Card CP-DCIWG.008*).

9.3 Work Programme

9.3.1 The group reviewed the current work plan (refer *SN03 – WG-MIE Work Plan*) and, based on discussions during the meeting, prepared a new version of the work plan activities, as given in Appendix D. It was also agreed that the WG-MIE would have four (4) work streams going forward:

- Work Stream 1: IWXXM Requirements (Coordinators: Patrick Simon, Pat Murphy)
- Work Stream 2: MET-SWIM Plan (Coordinator: Aaron Braeckel)
- Work Stream 3: IWXXM Documentation (Coordinator: Tim Hailes)
- Work Stream 4: Support & Coordination (Coordinator: Bill Maynard)

Agenda Item 10: Con-joint WG-MRI and WG-MIE Meeting

10.1 Con-joint Meeting

10.1.1 The con-joint meeting discussed common issues relating to the WG-MRI and WG-MIE (refer to *IP10 – Framework for the Joint Meeting of the WG-MRI and WG-MIE*). It was noted that the WG Rapporteurs (Bill/Dennis/Sue) are on both groups and can coordinate activities and get volunteers for specific activities/actions if required. Minutes to this meeting are provided in a separate report.

Agenda Item 12: Closure of the meeting

12.1 Meeting Schedule

12.1.1 The following WebEx meeting schedule was agreed (subject to change if necessary):

- 1100 – 1230Z on 16 August 2017;
- 1100 – 1200Z on 20 September 2017;
- 2000 – 2100Z in October 2017 (exact date to be determined).

12.1.2 It was agreed that the next face to face meeting should be held from 30 April to 4 May 2018, maybe with TT-AvXML. Possible location: Boulder.

12.2 Meeting Closure

12.2.1 The meeting closed at 14:30 hours on 13 July 2017.

APPENDIX A – Attendance

Rapporteurs	**Address**	**Contact phone / email**
Sue O'Rourke	Bureau of Meteorology, Australia	+61 3 9669 4662 +61 418 234 138 sue.orourke@bom.gov.au
Bill Maynard	Transport Canada, Canada	+1 613 991 4946 william.maynard@tc.gc.ca
Secretariat	**Address**	**Contact phone / email**
Neil Halsey	ICAO (METP), Canada	+1 514 954 8219 ext 6107 nhalsey@icao.int
Raul Romero	ICAO (METP), Canada	rromero@icao.int
Alex Pufahl	ICAO (IMP), Canada	
Advisors/Experts	**Address**	**Contact phone / email**
Dennis Hart	EUROCONTROL	+32 2 729 3050 dennis.hart@eurocontrol.int
Tim Hailes	Bureau of Meteorology, Australia	+61 3 9669 4273 tim.hailes@bom.gov.au
Graham Easthope	NATS, United Kingdom	+44 148 988 7166 graham.easthope@nats.co.uk
Jason Watts	NATS, United Kingdom	jason.watts@nats.co.uk
Nigel Gait (13 July)	UK MetOffice	nigel.gait@metoffice.gov.uk
Peter Lechner	Civil Aviation Authority, New Zealand	+64 4 233 9202 peter.lechner@caa.govt.nz
Steve Foreman	WMO, Geneva, Switzerland	+41 22 730 8171 SForeman@wmo.int
Patrick Simon	Meteo-France, France	+33 5 61 07 8150 patrick.simon@meteo.fr
Boon Leung Choy (part via WebEx)	Hong Kong Observatory, Hong Kong, China	+85 2 2926 8350 blchoy@hko.gov.hk
Mr Pian Xiaochuan	Aviation Meteorological Centre, ATMB, CAAC, China	+86 10 8792 2092 pianxc@126.com
Hans-Rudi Sonnabend	IATA (Lufthansa)	hans-rudi.sonnabend@lhsystems.com
Kaislin Kopka	IATA (Lufthansa)	kaislin.kopka@lhsystems.com
Fernando Rodriguez	IATA	prolasrodriguezf@iata.org
Brent King	IATA	kingb@iata.org
Jean-Francois Grout	IATA	groutj@iata.org

Susanne Biermann-Höller (part via WebEx)	ICAO Information Management Panel	+49 6103 707 1770 susanne.biermann@dfs.de
Peter Rudolph (part via WebEx)	ICAO Information Management Panel	+49 7556 452 1781 peter.rudolph@a4f.aero
Michael Pat Murphy	Federal Aviation Administration, USA	+1 202 267 2788 +1 816 695 2383 Michael.Murphy@faa.gov
Alfred Moosakhanian	Federal Aviation Administration, USA	+1 202 267 0792 +1 202 480 7581 Alfred.Moosakhanian@faa.gov
Larry Burch	AvMet, USA	+1 703 284 7330 burch@avmet.com
Aaron Braeckel	NCAR, USA	+1 303.497 2806 braeckel@ucar.edu
Melissa Peterson	AvMet, USA	peterson@avmet.com
Ngouaka Dieudonne	ASECNA	+221 33 869 57 14 +221 77 728 89 48 (mobile) ngouakadie@asecna.org dngouaka@yahoo.fr
Gamaiak Vareldzhian	Aviamet Telecom, Russian Federation	+7 499 795 2457 mywill@yandex.ru
Dmitry Moryakov	Main Aviation Meteorological Center, Russian Federation	+7 916 684 7820 moryakovdv@gmail.com
Jun Ryuzaki	Japan Meteorological Agency, Japan	+81-3-3212-8341 (ext.2298) jryuzaki@met.kishou.go.jp jryuzaki18@gmail.com
Dirk Zinkhan	Deutscher Wetterdienst (DWD), Germany	+49 69 8062 2698 dirk.zinkhan@dwd.de
Gilles Ratté	Environment Canada, Canada	+1 514 283 6777 gilles.ratte@canada.ca
Eric Dupuis	Nav Canada, Canada	+1 613 563-3437 Eric.dupuis@navcanada.ca

APPENDIX B – MIE/3 Papers

STUDY NOTES

No.	Agenda Item	Title	By
SN01	1	Provisional Agenda	Sue O'Rourke
SN02	1	WG-MIE Minutes from June WebEx	Sue O'Rourke
SN03	1 & 9	WG-MIE Work Plan	Sue O'Rourke
SN04	2	Work Stream 1 – IWXXM Requirements Status Report	Patrick Simon
SN05	2	TT-AvXML – Activities Update	Steve Foreman
SN06	2 & 3	IWXXM 3.0 and Beyond	Aaron Braeckel
SN07	2	IWXXM Validation by the SADIS and WIFS Gateway Providers	Graham Easthope
SN08	2	IWXXM Statistics to be Provided by the ROCSs and RODBs	Patrick Simon
SN09	2	Translation Centre Operations	Patrick Simon
SN10	2	Partially Translated Messages from TAC To IWXXM	Patrick Simon
SN11	3	Work Stream 2 – Future IWXXM Requirements Report	Pat Murphy
SN12	3	Additional Operational Status Indicators	Chris Tyson
SN13	3	Consider a clear separation between TAC and IWXXM	Patrick Simon
SN14	3	IWXXM elements to be considered by ICAO, to be communicated to WMO	Patrick Simon
SN16	4	Plan for Meteorology in System Wide Information Management (SWIM)	Aaron Braeckel
SN17	4	Roadmap for Meteorology in System Wide Information Management (SWIM)	Aaron Braeckel
SN18	4	MET-SWIM Open Topics	Aaron Braeckel
SN20	5	Work Stream 4 – IWXXM Documentation	Tim Hailes
SN21	5	Guidelines on the use of Operational and Non-operational Status Indicators in IWXXM Messages	Chris Tyson
SN23	5	IWXXM and AMHS requirements in Annex 3	Patrick Simon
SN24	6	Work Stream 5 – Status Report	Bill Maynard
SN25	6	Change Configuration Board for IWXXM	Pat Murphy
SN26	2	Translation of Significant Weather Objects to XML	Pat Murphy
SN27	4	MET-SWIM Issues	Secretariat
SN28	5	Guidelines for IWXXM Transition	Patrick Simon

INFORMATION PAPERS

No.	Agenda Item	Title	By
IP01	1	Arrangements for the Meeting	Sue O'Rourke
IP02	1	Attendance	Sue O'Rourke
IP03	1	List of Papers	Sue O'Rourke
IP04	1	Order of Discussion	Sue O'Rourke
IP05	1 & 9	Job Card METP.004	Sue O'Rourke
IP06	1 & 9	Job Card CP-DCIWG.008	Sue O'Rourke
IP07	2	Outcome from the EUR ICAO IWXXM Workshop	Patrick Simon
IP08	2	Space Weather Advisory	Larry Burch
IP09	4	Introduction of "Information Services Concept of Operations" Document from the ICAO Information Management Panel Services Working Group	Pat Murphy
IP10	10	Framework for the Joint Meeting of the WG-MRI and WG-MIE	Bill Maynard

PRESENTATIONS

No.	Agenda Item	Title	By
SP01	4	IMP – METP/WG-MIE Inter-Panel Coordination	Susanne Biermann-Höller Peter Rudolph
SP02	4	IMP Structure	Susanne Biermann-Höller Peter Rudolph

APPENDIX C – METP.004 Job Card

METP.004.02	Inclusion of aeronautical meteorological information in the SWIM-enabled environment and further development of the SWIM concept relating to meteorology.
Source	MET Divisional Meeting 2014 (Recommendation 2/2, 3/2 and 3/3)
Problem Statement	Aeronautical meteorological information needs to be integrated into the SWIM-enabled environment which introduces unique issues relating to governance and data management.
Specific Details	It was recommended by the MET Divisional Meeting (Recommendations 2/2, 3/2 and 3/3) that an appropriate ICAO expert group, in close coordination with WMO, develop provisions to enable the inclusion of aeronautical information in the future system-wide information management (SWIM) environment consistent with the Fifth Edition Doc 9750, Global Air Navigation Plan. Further principles were also identified to guide the development of the SWIM concept relating to meteorology as provided in Appendix B of Agenda Item 3 of the Meteorology Divisional Meeting 2014 (Doc 10047). The transition from the Internet-based SADIS/WIFS system is an integral part of these considerations as are the intermediate steps towards full SWIM by making the Annex 3 products IWXXM-compliant. This will involve the resolution of institutional issues that solely relate to the management and use of aeronautical meteorological information and the necessary links between information supporting other domains in the aviation field and in meteorology supported by the World Meteorological Organization. Further development should take into consideration the main legacy tasks from the meteorological aeronautical requirements and information exchange project team (MARIE-PT), Satellite Distribution System for Information Relating to Air Navigation Operations Group (SADISOPSG) and the World Area Forecast System Operations Group (WAFSOPSG) that relate to information exchange.
Expected Benefit	The full integration of aeronautical meteorological information into the SWIM environment will enable the full benefits to be derived relating to safety and efficiency.
Reference Documents	ICAO Annex 3 - Meteorological Service for International Air Navigation ICAO Doc 8896 - Manual of Aeronautical Meteorological Practice ICAO Doc 9750 - Global Air Navigation Plan ICAO Doc 10003 - Manual on the Digital Exchange of Aeronautical Meteorological Information ICAO Doc 10045 - Report of the Meteorology Divisional Meeting 2014 ICAO Doc 10039 – Manual on System Wide Information Management (SWIM) Concept
Deliverable Expert Group	Meteorology Panel (METP)

ID	Document affected	Description of Amendment proposal or Action	Supporting Expert Group	Status	Expected Dates:		
					Delivery Date	Effective	Applicability
1705	Annex 3	Standards for IWXXM compliant METAR, SPECI, TAF, SIGMET, AIRMET, VAA and TCA exchange	-	On-schedule	Q3 2016	Jul 2018	Nov 2020
1686	Manual of Aeronautical Meteorological Practice (Doc 8896)	Update related guidance material to support the implementation of Annex 3 Amendments	-	On-schedule	Q1 2018	Jul 2018	Nov 2018

1687	Manual on Digital Exchange of AMET Information (Doc 10003)	Update related guidance material to support the implementation of Annex 3 Amendments	-	On-schedule	Q1 2018	Jul 2018	Nov 2018
1706	PANS-MET (Doc ###)	Amendment to facilitate the introduction of the meteorological component of SWIM.		On-schedule	Q2 2018	Jul 2018	Nov 2020
9665	Annex 3	Amendment to facilitate the introduction of the meteorological component of SWIM.		On-schedule	Q2 2018	Jul 2018	Nov 2020
	Manual on SWIM Concept (Doc 10039)	Introduce MET related guidance material	IMP		Q2 2018	Jul 2018	Nov 2020
	Guidance for the Implementation of OPMET data exchange using IWXXM	Update to the document (*updated yearly)			Q2 2017	Nov 2017	Nov 2017
	MET-SWIM Road Map	Develop an initial roadmap for the implementation of met information into a SWIM environment	IMP		Q1 2018	Jul 2018	Nov 2018
Status: Approved		**Priority:**	**Initial Issue Date:** 17 Jun 2015	**Date approved by ANC:** 07 Jun 2017		**Session / Meeting:** 205-4	

Noting that the highlighted rows were mistakenly omitted from the current version of the METP.004 Job Card.

APPENDIX D – WG-MIE Work Plan

Work Stream 1: IWXXM Requirements		
Group: Patrick Simon (Co-Coordinator), Pat Murphy (Co-Coordinator), Aaron Braeckel, Boon Leung Choy, Dirk Zinkhan, Steve Foreman, Graham Easthope, Gilles Ratte, Pian Xiaochuan, Dmitry Moryakov, Larry Burch		
Activity / Milestone	**Accountability**	**Date**
Activity 1.1: IWXXM Validation. Validation of the IWXXM schema and documentation.	**Choy**, Patrick, Aaron	Aug 2017
Activity 1.2: TT-AvXML Liaison. Liaison with TT-AvXML regarding SARP requirements and changes to IWXXM schema.	**Patrick**, Steve	Ongoing
Activity 1.3: Data Categorization. Review the current policy on data categorization/rounding for IWXXM messages (i.e.as METAR cloud bases rounded to the lower 100s of feet) and make recommendations regarding the future policy.	**Pat**	Targeted for Amd 79+
Activity 1.4: SI Units. Investigate the need, if any, to implement a policy of SI units only Annex 3 units in IWXXM messages and make recommendations regarding the future policy.	**Pat**, Gilles, Dmitry	Targeted for Amd 79
Activity 1.5: RHWAC Requirements. Determine, in conjunction with WG-MISD, the RHWAC requirements needs for IWXXM (noting that no TAC is required).	**Pat**	Sep 2018
Activity 1.6: Partially Translated Messages. That WG-MIE further investigate if a policy related to partially translated messages from TAC to IWXXM should still be applied after the amendment 78 applicability date for IWXXM data.	**Pat**	MIE/4
Activity 1.7: IWXXM SARPs for SIGWX. That WG-MIE develop draft IWXXM SARPs for Annex 3 Amendment 79 for SIGWX, for consideration by the METP.	**Pat**, Neil, Graham, Larry	MIE/4
Activity 1.8: IWXXM data representation of SIGWX elements. That WG-MIE, in conjunction with WMO, investigate how we could represent the elements/information currently within a SIGWX in IWXXM form, which can then be visualised (text and graphic) downstream (ie. starting with data/XML and deriving human-readable products from the data – rather than the other way around).	**Pat**, Graham	2019
Activity 1.9: IWXXM benefits. That WG-MIE identify the areas where IWXXM can be of greatest benefit and identify the limitations of the existing TAC messages.	**Pat**, Neil	MIE/4
Activity 1.10: Missing parameters in METAR. Propose an update to Annex 3, amendment 79, and related guidance material, to provide information on how to deal with missing/incorrect mandatory meteorological parameters within the METAR to ensure that the other parameters are still available and that it doesn't fail validation once translated into IWXXM.	**Patrick**, Neil	MIE/4
Activity 1.11: Translation from XML to TAC. Consider whether formal and standard translation mechanisms (during the time where TAC and IWXXM co-exist) from XML to TAC should be developed by ICAO and WMO and made available to aeronautical stakeholders.	**Pat**, Tim, Steve, Patrick, Peter, Pian	MIE/4

Activity 1.12: TAC elements difficult to translate. Identify the elements or descriptions of elements within TAC that are not easily translated to XML and, after considering the needs of the users (through WG-MRI), whether these should be removed from Annex 3.	**Choy**	MIE/4
Activity 1.13: IWXXM and TAC. Consider further actions to start the separation of the link between TAC and IWXXM that inhibits the evolution of IWXXM, particularly taking into account the transition to SWIM.	**Patrick**, Aaron	MIE/4
Activity 1.14: Meteorological Zones described by SIGMET information. That WG-MIE, in coordination with WMO, consider the need for defining zones affected by meteorological phenomena as described in a SIGMET, as an intersection between a polygon (meteorological phenomena) and an external reference to an airspace (ie. FIR) in cases where the meteorological phenomena exceeds the airspace boundary.	**Aaron**	MIE/4
Activity 1.15: IWXXM Change Process. That WG-MIE conduct a gap analysis as to where the IWXXM change process can be improved and look how we can be more inclusive in the working of the group.	**Steve**, Neil Pat, Tim	MIE/4

Work Stream 2: MET-SWIM Plan		
Group: Aaron Braeckel (Coordinator), Pat Murphy, Boon Leung Choy, Dennis Hart, Alfred Moosakhanian, Steve Foreman, Patrick Simon, Susanne Biermann-Höller, Tim Hailes, Grahame Easthope, Peter Rudolph, Dmitry Moryakov, Sue O'Rourke, Bill Maynard, Kaislin Kopka, Ngouaka Dieudonne		
Activity / Milestone	**Accountability**	**Date**
Activity 2.1: MET-SWIM Plan & Roadmap. In conjunction with the IMP, further develop the draft *Plan for Meteorology in System Wide Information Management* (MET-SWIM Plan) and *Roadmap for Meteorology in System Wide Information Management* (MET-SWIM Roadmap). This includes developing proposals for incorporation of the MET-SWIM Plan contents either into Doc 10039 as an Appendix or as a separately published Doc.	**Aaron**, Pat	MIE/4
Activity 2.2: MET-SWIM Timelines. In conjunction with WG-MIE, determine the MET-SWIM timelines.	**Aaron**, Dennis	Nov 2017
Activity 2.3: SWIM Governance. Work with IMP on SWIM-related governance issues and attend the IMP governance working group as required and report back to WG-MIE.	**Pat**/Steve Susanne/Peter	ongoing
Activity 2.4: TCP/IP Networks and SWIM. That the WG-MIE invite the CP and IMP to provide assurance that the TCP/IP networks being installed today can be used in the SWIM environment in the future (during ASBU Block 1).	**Aaron**	Sep 2017
Activity 2.5: Data Policy. Work with WG-MRI to formalize a set of policies regarding XML, gridded data, TAC and other representations.	**Aaron**, Dennis, Patrick, Kaislin	MIE/4
Activity 2.6: High-fidelity Data. Work with WG-MRI to investigate high-fidelity MET information for SWIM.	**Aaron**, Dennis Patrick, Kaislin	MIE/4
Activity 2.7: Dissemination Architecture. Investigate and document data dissemination architecture options.	**Aaron**	Mar 2018

Activity 2.8: MET Producers. Work with WG-MRI to develop a list of MET information and MET producers required for SWIM.	**Aaron**, Dennis Patrick, Kaislin	MIE/4
Activity 2.9: ROC/RODB Functions. Determine the ROC/RODB functions and general architecture for MET-SWIM.	**Tim,** Aaron, Graham, Patrick, Neil, Ngouaka	MIE/4
Activity 2.10: Authoritative Source. Investigate the need for authoritative source and users in MET-SWIM.	**Dmitry**, Neil	MIE/4
Activity 2.11: Data use by Non-aviation Users. Work with WG-MCRGG to identify how SWIM technologies can be used to ensure that aviation MET data is exclusively used by its intended users.	**Bill**, Sue	MIE/4
Activity 2.12: MET-SWIM Testing. Share MET-SWIM testing results.	**Alfred**	ongoing

Work Stream 3: IWXXM Documentation		
Group: Tim Hailes (Coordinator), Patrick Simon, Neil Halsey, Boon Leung Choy, Graham Easthope, Steve Foreman.		
Activity / Milestone	**Accountability**	**Date**
Activity 3.1: Doc 8896. Publication of Doc 8896 (aligned with Annex 3, Amd 77.	**Neil**	Sep 2017
Activity 3.2: Doc 10003. Publication of Doc 10003 (aligned with Annex 3, Amd 77.	**Neil**	Sep 2017
Activity 3.3: Doc 8896. Review & update Doc 8896 to include information on IWXXM-related changes proposed in Annex 3, Amd 78.	**Patrick**	MIE/4
Activity 3.4: Doc 10003. Review & update Doc 10003 to include information on IWXXM-related changes proposed in Annex 3, Amd 78.	**Choy**	MIE/4
Activity 3.5: IWXXM Guidelines. Review the '*Guidelines for the Implementation of OPMET Data Exchange using IWXXM'.*	**Tim**	MIE/4
Activity 3.6: IWXXM Guidelines – Validation Statistics. Update and merge ROC/RODB IWXXM Validation Statistics into *'Guidelines'* document.	**Tim**	Dec 2017
Activity 3.7: IWXXM Guidelines – Translation Centres. Update and merge Translation Centre Operations, including draft agreement, into *'Guidelines'* document.	**Pat**	Dec 2017
Activity 3.8: IWXXM Guidelines – Status Indicators. Update and merge Guidelines on Status Indicators into *'Guidelines'* document.	**Graham**	Dec 2017
Activity 3.9: IWXXM Guidelines - Testing. Update and merge IWXXM Exchange Testing into *'Guidelines'* document.	**Graham**	Dec 2017
Activity 3.10: IWXXM Guidelines - AMHS. Update and merge AMHS Profile into *'Guidelines'* document.	**Graham**	Dec 2017
Activity 3.11: TT-AvXML & WG-MIE Working Arrangements. In conjunction with WMO, document the working arrangements between WMO TT-AvXML and ICAO METP WG-MIE.	**Steve**, Neil	Dec 2017
Activity 3.12: ICAO documentation. Investigate which other Annexes (ie Annex 6, 10, 11, 15) and ICAO documents (ie. Doc.9377) need to be updated to reflect the introduction of meteorological information in IWXXM form.	**Tim**, Patrick	Dec 2017

Activity 3.12: Annex 3. Prepare a proposal for Annex 3 amendment 79 relating to IWXXM, including AFTN references.	**Tim**, Patrick	MIE/4

Work Stream 4: Support & Coordination		
Group: Bill Maynard (Coordinator), Sue O'Rourke, Neil Halsey, Alfred Moosakhanian, Steve Foreman		
Activity / Milestone	**Accountability**	**Date**
Activity 4.1: Work Plan. Update the Work Plan as required.	**Sue**, Bill	Jul 2017
Activity 4.2: Job Card. Review Job Card METP.004 Job Card.	**Sue**, Bill	Jun 2018
Activity 4.3: Meetings. Arrange, chair and document regular teleconferences (via WebEx).	**Sue**, Bill	Monthly
Activity 4.4: Meetings. Arrange, chair and document annual face-to-face meetings, to be held in conjunction with other relevant ICAO or WMO meetings where possible.	**Sue**, Bill	May 2018
Activity 4.5: Website. Maintain the WG-MIE website, ensure that the most up-to-date information is available to Members and their advisors.	**Neil**, Bill	Ongoing
Activity 4.6: CP Coordination. Coordination with Communications Panel (CP), including IWXXM testing over AMHS.	**Neil**, Alfred	Ongoing
Activity 4.7: IWXXM Statistics. Invite WG-MOG to ask SADIS/WIFS Providers to establish IWXXM availability statistics.	**Sue**	Jul 2017
Activity 4.8: Partially Translated Messages. Invite WMO to provide an IWXXM schema allowing specific tags when translation fails.	**Sue**	Jul 2017
Activity 4.9: IWXXM Schema for SIGWX. Invite WMO to develop SIGWX IWXXM schema.	**Sue**	Jul 2017
Activity 4.10: IWXXM Timeline. Develop a timeline to look at the activities and associated timeframes related to the development of schema and documentation related to IWXXM, both within WMO and ICAO.	**Bill**, Steve	Sep 2017
Activity 4.11: Missing METAR Parameters: Invite WMO to implement support for missing/incorrect mandatory meteorological parameters within the METAR within IWXXM 3.0 to ensure that the other parameters are still available and that it doesn't fail validation once translated into IWXXM.	**Sue**	Jul 2017
Activity 4.12: IWXXM Schema Versions: Invite WMO to consider defining and documenting a policy on IWXXM schema versioning that would clearly differentiate which versions are to be used for evaluation and which versions can be used operationally to support specific Annex3 amendments.	**Sue**	Jul 2017
Activity 4.13: Collect Schema. Invite WMO to document that the collect schema is mandatory even for a single IWXXM message.	**Sue**	Jul 2017
Activity 4.14: WG-MIE Workshop. Hold a short workshop, in conjunction with the next face-to-face meeting, to brainstorm issues relating to IWXXM and MET-SWIM.	**Sue**, Bill	May 2018