

PLAN for the COST RECOVERY and GOVERNANCE SUPPORTING REGIONAL HAZARDOUS WEATHER ADVISORY CENTRES

METWSG Action Agreed 5/3

SUBJECT TO ENDORSEMENT BY THE METEOROLOGICAL WARNINGS STUDY GROUP (METWSG)

1. Overall Objective

To develop a plan for the future governance and equitable cost recovery of a regional SIGMET advisory system for hazardous meteorological conditions for international civil aviation.

This plan and associated discussion is expected to support recommended actions concerning aeronautical meteorological service provision arising from ICAO's 12th Air Navigation Conference (AN-Conf/12 held 19 to 30 November 2012), and, importantly, the strategic statement relating to the provision of information on hazardous meteorological conditions to international civil aviation from regional advisory centres.

This paper details some of the issues relating to the future governance and cost recovery arrangements of the regional hazardous weather advisory centres (RHWAC) and provides an initial plan for development to assist discussion at the forthcoming Meteorology (MET) Divisional Meeting in July 2014.

The plan is intended to support and align with the programme and timing of the aviation system block upgrades (ASBUs)¹.

Refer: Agreed Action 5/3, Meteorological Warnings Study Group (METWSG), 5th Meeting, Montréal, 20 to 21 June 2013 – see Appendix 1.

2. Problem Definition

2.1 Strategy Linkage

The concurrent strategic paper on the Future Provision of Information on Hazardous Meteorological Conditions (deriving from the Agreed Action 5/1, METWSG, 5th Meeting) sets out that there is a significant and long standing issue regarding deficiencies in some ICAO Regions concerning SIGMET provision and harmonisation within the current State Meteorological Watch Office (MWO) flight information region (FIR)-based system.

Some States have a chronic lack of capacity² to fully meet their Annex 3 – *Meteorological Service for International Air Navigation* responsibilities. In particular, some smaller developing States have difficulty with SIGMET provision. Some developed States also have significant problems in this area³. These difficulties result in particular MWOs not being able to issue SIGMETs in a timely, reliable, or accurate manner.

A three phased remedial strategy is proposed in response to long voiced concerns from users (IATA and others) regarding the safety and efficiency of operations in areas where SIGMETs are rarely, if ever, issued for hazardous meteorological conditions.

¹ ASBUs methodology contained in the Fourth Edition (2013) of ICAO's Global Air Navigation Plan (GANP) (Doc 9750-AN/963). The ASBUs provide target availability timelines for a series of operational improvements – technological and procedural – that will eventually realize a fully-harmonized global air navigation system.

² Capacity includes people, funding, expertise and underpinning infrastructure.

³ The acute lack of capacity of some States to meet many Annex 3 responsibilities regarding SIGMET issuance was emphasised during a SIGMET trial conducted by the METWSG in April to July 2011. This trial was aimed at testing the feasibility of regional SIGMET advisory centres (RSAC) assisting MWOs to issue SIGMETs by providing them with SIGMET advisory information.

2.2 Key Issue

There is currently no specific guidance or systems available through ICAO and WMO to assist in the funding or governance of regional centres providing advisory services on hazardous meteorological conditions.

3. The Plan

In direct relation to the *Statement of Strategic Intent* in the concurrent paper, *Future Provision of Information on Hazardous Meteorological Conditions*:

3.1 Assign an ICAO Expert Group by September 2014

The first objective will be to assign an ICAO expert group to have overall management responsibilities for developing the RHWAC scheme. The expert group would report on a regular basis to the Secretariat or directly to the Air Navigation Commission (ANC). Its work will need to include:

- (a) the development and implementation of permanent governance arrangements by mid-2015; and
- (b) the development and implementation of appropriate funding systems by mid- 2015.

The voice of key States should be represented on the expert group. In this regard, it is suggested that there be particular representation from a State or several States in each ICAO Region, and service provider and user representative bodies to supplement the expertise required (including WMO experts). The experience and capabilities of States involved in the development and operation of tropical cyclone advisory centre (TCAC), world area forecast centre (WAFC) and volcanic ash advisory centre (VAAC) responsibilities should also be represented on the expert group either through membership and/or defined relationships. The ICAO Secretariat will need to ensure that relevant ICAO financial and economic expertise is available (such as from within the Air Transport Bureau).

3.2 Develop and Implement Governance Arrangements by mid-2015

In developing robust governance arrangements, the expert group will need to consider, taking into account those matters considered in this paper:

- (a) all technical management issues in establishing the RHWACs;
- (b) establishment of formal governance processes within the ICAO framework, documentation and reporting;
- (c) product validation/verification processes and routine assessment and reporting; and
- (d) financial management relationships, accounting and reporting procedures.

3.3 Develop and Implement of Appropriate Funding Systems by mid-2015

In developing robust funding systems, the expert group will need to consider taking into account those matters considered in this paper:

- (a) all possible alternatives, including those set out in this paper;
- (b) current cost recovery systems and guidance from both ANSPs and NMHSs that cover FIRs outside respective State territories;
- (c) extensive consultation and discussion with key stakeholders and possible third party assistance (for example, World Bank, Regional Development Banks);
- (d) the most expeditious method for accounting, reviewing and reporting on revenue and allocation to the RHWACs; and
- (e) the most expeditious method for RHWACs to report financial estimates, budgets and financial

performance.

3.4 Complete all arrangements by the end of 2015

The target for ensuring good governance and funding systems are in place is the end of June 2015. It is expected that this will enable the first RHWACs to be established on a firm foundation within the time-scale set out in the *Statement of Strategic Intent* for regional centres – i.e. by the end of 2015.

As other regional centres are progressively developed they will have an already operating governance and financial system to engage, making the process straight forward and largely of a technical nature.

4. Background Considerations

This section sets out background information taken into account in the derivation of the plan for funding and governance of the future provision of advisory information on hazardous meteorological conditions.

4.1 ICAO Strategic Objectives

ICAO has established three Strategic Objectives for years 2011, 2012 and 2013:

- (a) Safety: Enhance global civil aviation safety;
- (b) Security: Enhance global civil aviation security; and
- (c) Environmental Protection and Sustainable Development of Air Transport: Foster harmonized and economically viable development of international civil aviation that does not unduly harm the environment.

In years 2014, 2015 and 2016 the number of strategic objectives of ICAO will increase to five. Ten key air navigation policy principles⁴ are contained in the GANP, intended to guide global, regional and State air navigation planning consistent with ICAO's strategic objectives.

4.2 Existing International Guidance

Extensive ICAO guidance on cost recovery is provided in *the Manual on Air Navigation Services Economics* (Doc 9161). This detailed manual sets out the ICAO policy on cost recovery and provides a robust array of perspectives that need to be taken into account in designing cost recovery systems. Appendix 3 of Doc 9161 details the guidance for determining the costs of aeronautical meteorological services. Additionally, ICAO's *Policies on Charges for Airports and Air Navigation Services* (Doc 9082) provides guidance on cost recovery.

WMO provides a *Guide to Aeronautical Meteorological Services Cost Recovery: Principles and Guidance* (WMO Publication No. 904). This publication contains additional information on the principles of cost allocations for National Meteorological Services and other providers of meteorological services to aviation, but currently does not provide guidance on multi-State/multi-FIR based cost recovery mechanisms.

4.3 Existing Regional Schemes

At present, within the ICAO framework there are:

- (a) nine volcanic ash advisory centres (VAACs) (namely Anchorage, Buenos Aires, Darwin, London, Montreal, Tokyo, Toulouse, Washington and Wellington) as part of the international airways volcano watch (IAVW)
- (b) seven tropical cyclone advisory centres (TCACs) (namely Darwin, Honolulu, La Réunion, Miami, Nadi, New Delhi and Tokyo), and

⁴ Refer Doc 9750-AN/963 — 2013-2028 Global Air Navigation Plan.

- (c) two world area forecast centres (WAFCs) (namely London and Washington) as part of the world area forecast system (WAFS)

In addition, there is the ICAO Satellite Distribution System (SADIS) that provides OPMET information and WAFS forecasts to States/users in the ICAO EUR, AFI, MID and western part of the ASIA/PAC Regions.

With the exception of the SADIS, which has a governance and cost recovery arrangement in place, there are no regional cost recovery arrangements in place for any of the other regional or global centres referred to above.

Currently the IAVW, WAFS and SADIS all have a governance structure in place by way of ICAO operations groups – namely the IAVWOPSG, WAFSOPSG and SADISOPSG – which report to the Air Navigation Commission and/or Planning and Implementation Regional Groups (PIRGs) of ICAO on a routine basis. These operations groups consist of, inter alia, the provider States, States who make use of the services provided, airline users represented by IATA, and flight crew users represented by IFALPA. ICAO provides the Secretariat support for these operations groups.

These operations groups currently meet on a 12- or 18-month cycle and each has a similar agenda that includes:

- (a) review of associated regional and/or global ICAO provisions;
- (b) operation of the centres or systems;
- (c) development of the centres or systems; and
- (d) long term development and implementation issues.

WMO arranges for the governance for the TCACs. A technical co-ordination meeting involving all of the TCAC provider States currently takes place once every three years, however a number of regional committees (within the construct of the WMO Regional Associations) take place during the intersession period. There are no airline or flight crew user representatives on these particular WMO groups, however the ICAO Secretariat attends where resources allow.

4.4 Known Issues

Each State is responsible for the provision or facilitation, and funding of its meteorological service. Some States contract out the work and rely on those contractors to recover costs through third party mechanisms. Others meanwhile fund service directly from taxes or through air traffic services (ATS) and airspace levies and charges. In many cases, airlines and operators have little input into how the State delivers the service and how it is funded, leading to a general lack of transparency.

Currently States that provide regional and global meteorological centres (such as the TCACs, WAFCs and VAACs alluded to above) have taken responsibility for funding and resourcing. Where cost-recovery takes place, airspace users receiving en-route air navigation services (ANS) within the particular State's FIR(s) may be charged directly by the ATS provider or indirectly through other charging mechanisms bearing on airline operations. There is no international or regionally common scheme for the collection of revenue to support regional and global meteorological centres.

The demands on providing more accurate regional or global forecasts require constant improvements to the provider State's capability. This includes increasingly expensive computing capability for numerical weather prediction (NWP), data post-processing, as well as more sophisticated production software development. In this regard, States providing regional and global meteorological centre operations have generally noted that there is increasing scrutiny being applied to these costs by operators.

The additional costs of providing such services for aviation can no longer be considered marginal or just a bi-product of the routine activities. Staff resources and infrastructure costs to provide these often complex and demanding services are needed; in addition, they also have to be tested and exercised on a regular basis.

An important aspect for any regional centre is the need to share information with neighbouring States and other centres⁵. Operationally meeting this requirement, let alone the cost, may well be above and beyond what the provider State would normally be required to undertake if it was not a regional centre.

Generally speaking, airlines/operators overflying the regional centres area of operation but not the provider State FIRs currently do not contribute to the cost of the provision of the particular service. In a regionalised scheme, this highlights that current cost State/FIR-based recovery methodologies would be materially inequitable.

5. Discussion

5.1 Management and Governance

It is considered that similar arrangements of governance to the existing regional and global centres alluded to above could be utilised for the RHWACs - a global group of experts advising ICAO on the operation of the service and its effectiveness in meeting user requirements.

Careful consideration is needed as to the makeup of the ICAO expert group(s) that would oversee the work of the RHWACs, noting the need for a variety of expertise not just in meteorology but airline operations, air traffic management (ATM) and cost recovery. The expert group would need to ensure best practices are developed and shared between the RHWACs.

More local discussions relating to the day-to-day operation of the RHWACs should take place at the ICAO regional MET sub-group meetings (or equivalent) of the PIRGs, since these meetings would also allow States and users within the ICAO Region to have the opportunity to influence the development of the service and to propose changes to the requirements to particular or all RHWACs.

Governance structures must be in place to manage the establishment of the RHWACs. These governance structures (expert group(s)) would need to;

- detail the specific regional requirements (based on global ICAO provisions);
- arrange appropriate user consultation, produce guidance and usability guides for the products being provided;
- set out the performance indicators as agreed with the users;
- detail the meteorological information required from States (for example, observations);
- ensure there is a transparent costing, budgeting and long term investment plan in place;
- assist in the running (or development) of a cost recovery scheme; and
- review of performance, based on the performance indicators.

During implementation, governance could reside with a more local group (for example, a PIRG) that assists the State providing the RHWAC by providing guidance on policy and strategy during its initial operation. However, recognising the need for harmonized practices it is suggested that during the implementation phase a number of best practices workshops are held for the RHWACs.

The alternative is for a global expert group to oversee the establishment of the RHWACs as currently defined and as may be requested by the PIRGs.

It is noted that users have expressed a need for consistency between RHWACs, one aspect of the governance expert groups is to ensure that the advisory products are provided uniformly and in a similar manner and that change management principles are applied. Also critical to the work of the RHWACs will be the development and subsequent agreement of a common set of key performance indicators (KPIs) to ensure that the RHWACs meet the quality standards required by users.

⁵ Including, for example, pilot reports, satellite information and other observations.

It is considered that there are no additional liability issues for a State since all the information provided by the RHWAC is provided as guidance material only.

5.2 Funding

While in theory it can be relatively easy to determine what type of cost recovery system should be in place, practically this is not the case. There are complicated political considerations and administration arrangements that would need to be put in place and any such scheme also needs to be fair and enforceable.

The following excerpt from ICAO's *Policies on Charges for Airports and Air Navigation Services* (Doc 9082) provides details for the charges for air navigation services used by aircraft when not over the provider State. A similar policy could be developed for provision of meteorological services.

"53. The Council observes that the providers of air navigation services for international use may require all users to pay their share of the cost of providing them regardless of whether or not the utilization takes place over the territory of the provider State. Accordingly, wherever a State has accepted the responsibility for providing route air navigation services over another State, over the high seas, or in an airspace of undetermined sovereignty (in accordance with the provisions of ICAO Annex 11 — *Air Traffic Services to the Convention on International Civil Aviation* and Regional Air Navigation Agreements approved by the Council), the State concerned may levy charges on all users for the services provided. A State may delegate to another State or to an organization the authority to levy such charges on its behalf.

54. The Council also notes that the collection of air navigation services charges in cases where the aircraft does not fly over the provider State poses difficult and complex problems. It is for the States to find the appropriate kind of machinery on a bilateral or regional basis for meetings between provider States and those of the users, aiming to reach as much agreement as possible concerning the facilities and services provided, the charges to be levied, and the methods of collecting these charges."

Whilst the direct costs of provision will be relatively straightforward to identify, the allocation of additional core costs (i.e. infrastructure and underpinning services) will be more difficult. It is likely that additional guidance on the subject would need to be provided to assist States in order that a standardised allocation of costs is undertaken by the RHWAC provider States. This guidance would need to ensure States undertaking the operation of an RHWAC understand the need for transparency in determining the associated core costs.

Conversely, it is recognised that if an RHWAC were to have multiple functions, for instance if they were responsible for tropical cyclone, volcanic ash and other hazardous phenomena, this would reduce costs for training/competencies, administration for recovering costs, staff costs, data transfer, etc.

5.2.1 Cost Recovery Options

Creating a cost recovery arrangement for the RHWACs will provide an opportunity for users to influence the development work and have knowledge of the quality of information being provided. This will also allow users to compare the output from the RHWACs and see which provide quality services in a cost effective manner whilst recognising that the costs of providing the RHWAC service will vary due to the cost of living and other factors.

While the prospect of no cost recovery mechanisms is not ideal, this does not mean that a State hosting (providing) an RHWAC must cost recover. An RHWAC provider State could elect to meet costs from its own internal budgetary process.

5.2.1.1 No Regional Cost Recovery

In the past, when the provision of regional based advisory services were considered part-and-parcel of the National Meteorological Service (NMS) it could be argued that the costs of provision were relatively low and therefore the costs were "*de minimis*" (i.e. the effort to collect the charges does not justify the means since its effect on the en-route rate was low). However, as noted above, the costs of provision of regional and global meteorological services are increasing. The other possible concern to consider is that while it might be perfectly feasible for a large or well-developed State to bear this cost, this might

not be the case for smaller or developing States. This could result in discouraging important investment in capability.

5.2.1.2 Airspace Users / States contract directly with the State providing the regional service

Airline operators that conduct flights through a region being supplied with SIGMET advisories from a RHWAC would contract directly with the State providing the RHWAC service. In addition, there would be a facility for States within the region to make contractual arrangements with the RHWAC provider State in order that the NMS and other agencies (e.g. the ANSP) could receive the information.

This option is complex in that the role of contract Law between the RHWAC provider State and the airlines / users could be quite fraught, and expensive to administer. There is also the likelihood that either non-State based operators are denied access to the services or that a number of users do not pay but receive the information from other sources.

5.2.1.3 Regional Cost Recovery Scheme

The SADIS cost recovery scheme alluded to above is a good example of a regional cost recovery scheme, whereby each year the provider State establishes the costs of providing the service; this cost is then shared by the States that make use of the service according to usage information provided by ICAO. Such a model could be used for regional cost recovery of RHWAC. It is noted that countries designated by the United Nations as a Least Developed Country are not required to pay any share of the costs. A similar model is used in Europe for the central collection of en-route charges for regional institutions (i.e. Eurocontrol).

This option requires the support of all States in a given ICAO Region and would be open to argument as to the acceptance and/or proportionality of charges levied on each State.

5.2.1.4 Fee Collection

In the contemporary systems, the administration, record keeping and fee collection arrangements form a critical element for the success of such a scheme. In addition, any user - be it State or operator - that refuses to pay would almost certainly be able to receive the information from other sources. If substantial numbers of users do not pay then it is likely that the services provided from the RHWAC would be of lower quality since the resources and investment to maintain the service delivery at sustainable levels would not take place.

5.2.1.5 Third Party Alternative

From the discussion in this section it is clear that any State-based scheme to fund the RHWACs will be difficult to implement and manage due to complexity of relationships and State Law. An alternative to that approach is to use a method of third party funding. Consider:

- (a) IATA has 240 members comprising 84% of the total air traffic and provides the international electronic ticketing systems. IATA has real-time data on flights, origin, destination, route, passenger number and freight. Very significant levels electronic funds flow through the system⁶.

Inferred from ICAO data⁷ and for the three ICAO Regions currently under consideration for implementation of RHWACs, there were about six million aircraft movements in 2010. Using a crude estimation with an average of say 150 passengers per flight, this translates to nearly one billion passengers. A simple calculation would suggest that an IATA levy of around one cent (US\$) would yield around US\$10 million per year to fund the three RHWACs.

⁶ Refer IATA Annual Review 2013

⁷ Global Air Transport outlook to 2030 and Trends to 2040 (Cir 333, AT/190)

With activity growth expected to double by 2030, it could be expected that any IATA levy for the purpose would decrease over time.

The very significant difference in this third party/IATA approach is that it is not reliant on State acquiescence, legislation change, or basic contributory co-operation. The system could be established entirely by the two organizations with pre-set and annually adjusted funding going direct to the RHWACs.

(b) ICAO successfully administers the contributions from States (recovered from airlines) to fund the provision of certain international services through its joint financing program;

- Air Navigation Services in Greenland and Iceland (DEN/ICE),
- North Atlantic Height Monitoring System (HMS)

5.2.2 Summary

Any future cost recovery mechanism should ensure that there is:

- clear description of objectives and benefits;
- identification of facilities and services to be jointly financed;
- definition of the responsibilities of the different partners;
- simplicity and flexibility of the arrangements; and
- equitable recovery of costs through charges consistent with ICAO's policies on charges

5.3 Working Relationships

To ensure the success of the strategic plan there is a need to develop a co-ordinated working relationship with various organizations, service providers and users of services that includes but not necessarily defines all the stakeholders, including:

- WMO – World Meteorological Organization.
- IATA – International Air Transport Association.
- CANSO – Civil Air Navigation Services Organisation.
- IFALPA – International Federation of Airline Pilots' Associations.
- IFATCA - International Federation of Air Traffic Controllers' Associations.
- ISO - International Organization for Standardization.
- States in general (States in need of assistance, States able to provide RHWACs, States likely to be able to provide other assistance, VAAC and TCAC provider States)
- ICAO – Regional Offices.
- Particular contracting States with capability and capacity to serve as a regional centre.

Appendix 1

METEOROLOGICAL WARNINGS STUDY GROUP (METWSG)

FIFTH MEETING Montréal, 20 to 21 June 2013

EXCERPT OF SUMMARY OF DISCUSSIONS

Further study into a regional SIGMET advisory system (Deliverable 1)

3.1.1 The group recalled that it had formulated Action Agreed 4/1 at the last meeting concerning the development of a concept of operations for a global or multi-regional SIGMET advisory system and criteria for the selection of regional SIGMET advisory centres by the respective ICAO planning and implementation regional groups (PIRGs). In addition, Action Agreed 4/1 was to address the development of a revised format for the advisory information, the development of an amendment proposal to Annex 3 – *Meteorological Service for International Air Navigation*, and the development of a proposal for further study into a regional-based notification system rather than a flight information region (FIR)-based system form the reporting of hazardous meteorological conditions.

3.1.2 The group was pleased to learn that as follow-up to Action Agreed 4/1, an ad-hoc group (A) had prepared a necessary report addressing each of the referred items, intended to assist the group in its further consideration of this issue. The group noted in particular that the concept of operations provided background to the proposed establishment of regional SIGMET advisory centres, current operations and capabilities, concepts for the establishment of such regional centres, expected functional and performance requirements, operational scenarios and an assessment of the impacts of the introduction of regional SIGMET advisories in support of the issuance of SIGMET messages by meteorological watch offices.

3.1.3 To aid the deliberations, the group considered two further reports relating to the establishment of a regional SIGMET advisory system to aid the discussion. The first report concerned an analysis of wider issues and experiences in the provision of information relating to hazardous meteorological conditions, including the need to ensure that a long-term solution to a long-term problem (i.e. the lack of implementation of SIGMET in some parts of the world) was well founded, and the second report concerned issues related to the requirements for regional SIGMET advisory centres based on recent discussions and experiences within the Asia-Pacific Region, including consideration of the tools that may be necessary to assist in a regional SIGMET advisory production process and the need for a suitably established verification framework.

3.1.4 Taking all of these reports into account, the group considered in detail whether the concept of operations for a regional SIGMET advisory system, as developed thus far, was of a sufficient level of maturity to provide a basis for the development of Annex 3 provisions. Appreciating the efforts of the ad-hoc group in the development of the concept of operations, the group reflected that the concept of operations needed to ensure that the views of users and regulatory authorities were taken into account in future iterations. The group noted that some users/operators do not use SIGMET information for volcanic ash and tropical cyclone in flight planning. The group noted that the users (IATA and IFALPA) recorded their disappointment that the issues at hand had not progressed further than they had. The users reported continued inconsistency and lack of issuance of SIGMET information, and that the non-standardized format of the SIGMET information used by some meteorological watch offices was unacceptable. Notwithstanding the need for additional work on the concept of operations, the group noted that the users considered that an action plan that identified when and where the regional SIGMET advisory centres would come into operation was required. The group concurred that the concept of operations would be a “living document” going forwards and that there was a need to ensure that the concept of operations was supported by a high-level strategic statement relating to the short- and long-term vision for the provision of information relating to hazardous meteorological conditions.

3.15 Recognizing the evolving needs of aviation, and in particular the transition to global air traffic management supported by a system-wide information management environment, the group expressed that as meteorological information plays a more integrated role in strategic and tactical decision-making – of airline operators, flight crews, air traffic flow managers, air navigation service providers and others – the existing FIR-based approach to SIGMET provision would likely become a hindrance to progress unless some form of regional-based approach was realized in the longer-term. The group noted emerging issues such as governance and equitable cost recovery would have to be addressed regardless of whether future SIGMET provision was regional, multi-regional or global in nature.

3.1.6 Taking the foregoing into account, the group agreed to the following three-tiered strategy with which to progress this issue. Firstly, that a high-level strategic statement relating to the short- and long-term vision for the provision of information relating to hazardous meteorological conditions was needed in time for the MET Divisional Meeting. Secondly, that the concept of operations for hazardous meteorological conditions should continue to mature as a living document, taking inspiration from the referred high-level strategic statement and with inputs from users and regulatory authorities. And thirdly, that a plan for future governance and equitable cost recovery of such a regionalized-approach to meteorological service provision should be realized. The group formulated the following actions agreed accordingly:

Action Agreed 5/1 — High-level strategic statement relating to the short- and long-term vision for the provision of information for hazardous meteorological conditions

That, Albert, Bill, Colin, Hans-Rudi, Herbert, Juan, Jun, PW, Sue, Patrick, Peter (Rapporteur) and Steve develop a high-level strategic statement relating to the short- and long-term vision for the provision of information for hazardous meteorological conditions, and provide a report to the Secretary by 30 September 2013 for subsequent endorsement by the group through correspondence by 31 October 2013 so that the statement can be forwarded by the **Secretary** to:

- a) the ad hoc group A to assist in the follow-up to Action Agreed 5/2; and
- b) the Meteorology Divisional Meeting in July 2014.

Action Agreed 5/2 — Further development of a concept of operations for a regional SIGMET advisory system

That, an ad hoc group (WG/A) consisting of Albert, Bill, Colin, Hans-Rudi, Herbert, Juan, Jun, PW (Rapporteur), Patrick, Peter and Steve develop a further iteration to the concept of operations for a regional SIGMET advisory system for hazardous meteorological conditions that reflects the views of users and regulatory authorities and the short- and long-term vision provided through Action Agreed 5/1, and provide a report to the Secretary by 30 September 2013 for subsequent endorsement by the group through correspondence by 31 October 2013 so that the concept of operations can be forwarded by the **Secretary** to the Meteorology Divisional Meeting in July 2014 as information.

Action Agreed 5/3 — Plan for the future governance and equitable cost recovery of a regional SIGMET advisory system

That, Colin (Rapporteur), Herbert, Hans-Rudi, Patrick, Peter, Sue and Zhang develop a plan for the future governance and equitable cost recovery of a regional SIGMET advisory system for hazardous meteorological conditions, and provide a report to the Secretary by 15 October 2013 for subsequent endorsement by the group through correspondence by 15 November 2013 so that the concept of operations can be forwarded by the **Secretary** to the Meteorology Divisional Meeting in July 2014 as information.

— END —