



International Civil Aviation Organization

**The Sixth Meeting of the APANPIRG ATM Sub-Group
(ATM/SG/6)**

Hong Kong, China, 30 July – 03 August 2018

Agenda Item 6: AOP, MET, AIM, SAR

METEOROLOGY ISSUES RELEVANT TO ATM

(Presented by the Secretariat)

SUMMARY

This paper presents an overview of meteorology (MET) issues relevant to ATM arising from the Twenty-Second Meeting of the Meteorology Sub-group (MET SG/22), and its contributory bodies, for information and further discussion by ATM SG as appropriate.

1. INTRODUCTION

1.1 The International Civil Aviation Organization (ICAO) – Asia and Pacific Office hosted the twenty-second meeting of the Meteorology Sub-group (MET/SG/22) of the Asia/Pacific (APAC) Air Navigation Planning and Implementation Regional Group (APANPIRG) in Bangkok, Thailand from 18 to 21 June 2018.

1.2 The purpose of the meeting was to review progress on the MET SG's contribution to the APANPIRG work programme. MET SG/22 discussed regional matters in the field of aeronautical meteorology (MET), specifically in support of the APAC States/Administrations' planning and implementation of required MET service for international air navigation.

1.3 MET SG/22 provided participants the opportunity to overview the combined work programme of the contributory bodies of MET SG, namely the Meteorological Information Exchange Working Group (MET/IE WG), Meteorological Services Working Group (MET/S WG) and Meteorological Requirements Working Group (MET/R WG). However, MET SG/22 did not review outcomes from the fifth meeting of the Asia/Pacific Volcanic Ash Exercises Steering Group (APAC VOLCEX/SG/5), which occurred immediately after MET SG/22.

1.4 The Report of MET SG/22 and the Reports of its contributory bodies¹, including all associated meeting documentations, are at the ICAO Asia and Pacific Office website: www.icao.int/apac/Meetings.

¹ MET/IE WG/16 (19-21 Mar 2018), MET/S WG/8 (21-23 Mar 2018), MET/R WG/7 (21-23 May 2018) and APAC VOLCEX/SG/5 (21-22 Jun 2018)

2. DISCUSSION

Terms of reference of the MET SG

2.1 To improve the description of the working arrangements, procedures and limits of responsibility of the Sub Group, MET SG/22 supported a proposal to update the terms of reference of the MET SG with additional reference information from the *APANPIRG Procedural Handbook*. **Appendix 1** to this paper shows the proposed updates to the terms of reference. MET SG/22 noted that the Secretary would share the outcome of this discussion for further consideration by the other Sub Groups of APANPIRG.

2.2 MET SG/22 formulated **Draft Decision MET/SG/22/12: Updated terms of reference of the MET SG (including work plan)**, proposing that APANPIRG approves the updated terms of reference of the MET SG.

Outcomes from MET/IE WG/16, MET/S WG/8 and MET/R WG/7

2.3 MET/IE WG had commenced discussion on a proposed ICAO Meteorological Information Exchange Model (IWXXM) implementation workshop in the APAC Region in 2018. The MET SG Chair convened a side discussion during MET SG/22 to kick-start preparations for the proposed IWXXM workshop in 2018.

Engagement with user groups and Pacific Island States

2.4 MET SG/22 considered the need to promote participation by the user groups (e.g., IATA, IFALPA, IFATCA) and the Pacific Islands Aviation Weather Services (PIAWS) Panel in the MET/IE WG forum and the MET SG forum. MET SG/22 noted IATA had supported OPMET monitoring activities, for several years, and this would be required for future meetings of the MET/IE WG.

Transmission of special air-reports

2.5 MET/S WG was investigating the (negative) implications for meteorological service providers of the different formats (described in ICAO publications) for transmission of special air-reports with a view to the possible development of a proposal to standardize the format.

Chairperson of MET/R WG

2.6 MET/R WG/7 elected a new Chairperson, Mr. Ashwin Naidu (from the Australian Bureau of Meteorology), and Vice-Chairperson, Ms. Naoko Komatsu (from the Japan Meteorological Agency).

Development of regional guidance materials related to MET and ATM

2.7 MET/R WG/7 reported progress on the development of regional guidance materials including the *ASIA/PACIFIC Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management Operations* and the *Draft Guidelines for Operational SIGMET Coordination*. Further discussion on the above is at paragraphs 2.22 – 2.27.

Amendment 78 to ICAO Annex 3

2.8 Amendment 78 to ICAO Annex 3 includes, inter-alia, the introduction of space weather advisory information services, information on the release of radioactive material into the atmosphere, modifications of IWXXM representations of information, and consequential amendment concerning change of references related to the provision of aeronautical information service.

2.9 The effective date is 16 July 2018 and the applicability date is 8 November 2018, with the exception of embedded applicability dates: 7 November 2019 for the provisions concerning modifications of IWXXM representations of information and information on the release of radioactive material into the atmosphere; and 5 November 2020 for the provision concerning the IWXXM as a Standard.

Asia/Pacific Air Navigation Plan

2.10 MET SG/22 reviewed recent and proposed amendments to the MET Parts of the ANP and noted that the Secretariat would coordinate an amendment proposal to reflect the current requirements with respect to the designation of location indicators for aerodromes as advised by Indonesia and updates to the OPMET data availability for international aerodromes in Cambodia.

2.11 In view of the above, and other required updates to the MET Parts of the ANP, MET SG/22 supported the development of a comprehensive draft amendment proposal and adopted **Decision MET/SG/22/11: Draft proposal for amendment of the Asia and Pacific Air Navigation Plan, Volume I and Volume II.**

APANPIRG Air Navigation Deficiencies

2.12 MET SG/22 considered that the corrective actions implemented by Cambodia and Lao PDR validates rectification of the respective deficiencies listed in the MET field in Cambodia (which concern the provision of meteorological watch office, SIGMET information and WAFS forecasts and flight briefings) and Lao PDR (which concern the provision of SIGMET information).

2.13 MET SG/22 formulated **Draft Decision MET/SG/22/01: Removal of deficiencies Index No. AP-MET-09 and AP-MET-11 (Cambodia) from the APANPIRG (open) list, and Draft Decision MET/SG/22/10: Removal of deficiency Index No. AP-MET-12 (Lao PDR) from the APANPIRG (open) list.**

WAFS and SADIS update

2.14 MET SG/22 reviewed recent and planned changes to the World Area Forecast System (WAFS) and Secure Aviation Data Information System (SADIS) and noted that, as a precursor to next generation WAFS and SADIS improvements over the coming ten-years, a SADIS bandwidth upgrade expected during 2018 would result in significant increase in data download speed for users.

IWXXM implementation

2.15 MET SG/22 noted some progress reported on States' planning and implementation for extensible mark-up language (XML)-based OPMET exchange using IWXXM and adopted **Conclusion MET/SG/22/02: Status report on IWXXM and AMHS implementation**, in order to facilitate the planning and implementation by States/Administrations of IWXXM.

Development of MET to support ATM

2.16 Australia, China, Japan and United States provided information on initiatives and experiences in research, development and implementation of tailored aviation weather products and services to support air traffic management (ATM) and reduce the impact of weather on aviation systems.

2.17 MET SG/22 noted that (under the Convention) the obligation of States/Administrations is to supply users with the meteorological information necessary for the performance of the users' functions and, towards this end, the developments above highlighted the importance of close liaison between the suppliers and users of meteorological information.

VAAC activities

2.18 MET SG/22 noted the reported increase in the number of volcanic ash advisory information issued by Volcanic Ash Advisory Centres (VACCs) over the previous three years, in particular by VAAC Wellington, due to improved capabilities to identify volcanic ash using the latest generation of meteorological satellite¹, increased utilization of social media channels and improved communication with State Volcano Observatories.

SIGMET coordination

2.19 Hong Kong, China, Japan, Lao PDR, Myanmar, Philippines, Singapore, Thailand, United States and Vietnam presented information on the development and progress of international projects supporting collaboration and coordination on SIGMET issuance, which can benefit both the service providers and the service users in the aviation community.

2.20 With respect to the above, MET SG/22 noted that the States concerned have developed more than one computer-based platform for sharing relevant meteorological and other necessary information and supporting coordination among multiple MWOs. To support the coordinated approach to expanding the scope of these SIGMET coordination initiatives in the Region, MET SG/22 adopted **Conclusion MET/SG/22/03: Next steps to promote integration and expansion of SIGMET coordination.**

2.21 MET SG/22 noted that States should ensure that (meteorological) guidance products, provided by States to facilitate cross-FIR-boundary SIGMET coordination, are coordinated with the responsible authorities providing ICAO Annex 3-compliant MET information for the area of responsibility concerned. Therefore, MET SG/22 formulated **Conclusion MET/SG/22/04: Coordination of guidance products with the responsible authorities for ICAO Annex 3-compliant MET information.**

Regional Guidance for MET Information Supporting ATM

2.22 MET SG/22 reviewed proposed updates on the draft *Asia/Pacific Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management (ATM) Operations*, as presented by the designated ad-hoc group, and identified the need for further editorial improvements including the following:

- Add reference to SWIM-related developments in the APAC Region
- Add reference to ICAO Doc 9377 - *Manual on Coordination between Air Traffic Services, Aeronautical Information Services and Aeronautical Meteorological Services*
- Add updated reference to ICAO Doc 9750 – *Global Air Navigation Plan*

2.23 MET SG/22 noted the outcome from ATM/SG/5, concerning availability of the above document as a reference for the provision of Meteorological Information to ATM (Conclusion ATM/SG/5-2: *Asia/Pacific Regional Guidance for Meteorological Information Supporting ATM* refers). Therefore, MET SG/22 requested the ad-hoc group to address the editorial changes above and the Secretariat to upload the document, as a ‘working draft’ until formal approval by APANPIRG, on the ICAO website.

¹ Japan Meteorological Agency (JMA) made data from the latest generation Himawari-8 meteorological satellite available to States/Administrations in 2015.

2.24 In view of the above, MET SG/22 adopted **Conclusion MET/SG/22/07: APAC Regional Guidance for MET Information Supporting ATM**, to enable access to the working draft of the document on the ICAO website, and formulated **Draft Conclusion MET/SG/22/08: APAC Regional Guidance for MET Information Supporting ATM**, for APANPIRG to approve the guidance. See below:

Conclusion MET/SG/22/07: APAC Regional Guidance for MET Information Supporting ATM	
What: That, the Secretariat uploads the document provided in WP/14 to MET SG/22 as a ‘working draft’ to the ICAO website to obtain feedback from States and the ad-hoc group presents the revised document for review by the ATM/SG/6 before submission for possible approval by APANPIRG/29.	Expected impact: ☐ Political / Global ☐ Economic ☐ Environmental ☐ Inter -Regional ☒ Ops/Technical
Why: To provide States with up to date guidance material.	
When: As soon as practicable	Status: Adopted by MET SG
Who: ☒ Sub Groups ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:	

Draft Conclusion MET/SG/22/08: APAC Regional Guidance for MET Information Supporting ATM	
What: That, APANPIRG approves the <i>Asia/Pacific Regional Guidance For Tailored Meteorological Information And Services To Support Air Traffic Management Operations</i> as a reference for States and Organizations concerned.	Expected impact: ☐ Political / Global ☐ Economic ☐ Environmental ☐ Inter -Regional ☒ Ops/Technical
Why: 1) To assist States in developing and implementing tailored meteorological information and services to support effective air traffic management; and 2) To support follow-up action on Conclusion ATM/SG/5-2: <i>Asia/Pacific Regional Guidance for Meteorological Information Supporting ATM</i> .	
When: On approval by APANPIRG	Status: Draft to be adopted by APANPIRG
Who: ☒ Sub Groups ☐ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:	

Draft Guidelines for Operational SIGMET Coordination

2.25 Japan and Singapore presented the draft regional guidance for the alignment of cross-FIR-boundary SIGMET information, developed under the work plan of the MET/R WG, to assist States in aligning SIGMET information across adjacent FIR boundaries. MET SG intended the guidance as supplementary information to the Regional SIGMET Guide, in view of the need for consistency of SIGMET information for ATM.

2.26 MET SG/22 considered the need for a more thorough review of the draft guidelines by States and therefore requested the Secretariat to upload the document on the ICAO website as a ‘working draft’ until the MET SG formally adopts it as an Appendix to the SIGMET Guide.

2.27 In view of the above, MET SG/22 adopted **Decision MET/SG/22/09: Regional Guidelines for Operational SIGMET Coordination**, to enable access to the working draft of the document on the ICAO website.

Future work programme

2.28 MET SG/22 proposed updates to the work plan of MET SG based on outcomes of discussion throughout the meeting. **Appendix 1** to this paper shows the proposed updates to the terms of reference and work plan of MET SG.

2.29 In view of the above (note: paragraphs 2.1 and 2.2 also refer), MET SG/22 formulated **Draft Decision MET/SG/22/12: Updated terms of reference of the MET SG (including work plan)**, for APANPIRG to approve the updated terms of reference of the MET SG (including work plan).

Next meetings of MET/SG and its contributory bodies

2.30 MET SG/22 agreed to a tentative schedule as follows:

MET/IE WG/17	18 – 20 March 2019
MET/S WG/9	20 – 22 March 2019
MET/R WG/8*	27 – 31 May 2019
MET SG/23	Week commencing 17 June 2019

* In conjunction with a MET/ATM Seminar

2.31 APAC VOLCEX/SG/5 proposed the following tentative schedule for its next meeting:

APAC VOLCEX/SG/6** 13-14 June or 17-18 June 2019

**Immediately prior to MET SG/23

3. ACTION BY THE MEETING

3.1 The Secretariat invites the meeting to:

- a) note the information contained in this paper; and
- b) discuss any relevant matters as appropriate.

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APPENDIX 1

Proposed updates to the terms of reference and work plan of the METEOROLOGY SUB GROUP (MET SG)

Updates proposed by MET SG/22

1. Objectives of the MET SG

- a) Ensure the continuous and coherent development of the MET parts of the Asia/Pacific Regional Air Navigation Plan (APAC ANP) and other relevant regional documentation in a manner that is harmonized with adjacent regions, consistent with ICAO standards and recommended practices (SARPs), the Global Air Navigation Plan and the Global Aviation Safety Plan and reflects global requirements;
- b) Facilitate the implementation of aeronautical meteorological systems and services, as identified in the APAC ANP, Aviation System Block Upgrade (ASBU) priority modules and the Asia/Pacific Seamless ATM Plan elements, with due observance to the primacy of air safety, regularity and efficiency using the project management principles where appropriate; and
- c) ~~Review, identify and address specific air navigation deficiencies in the field of that impede the implementation or provision of effective and efficient aeronautical meteorological (MET) services in the Asia and Pacific Regions.~~

2. Functions of the MET SG Deliverables to meet the Objectives:

~~1) Progress report to be submitted to APANPIRG, addressing the MET SG deliverables (listed in 2 to 9 below);~~

- a) ~~Review MET parts of the APAC ANP to be reviewed and, as necessary, prepare amendment proposals prepared as necessary to update the APAC ANP to reflect updates and changes in the operational and global requirements;~~
- b) ~~Monitor the level of and, as necessary, facilitate the implementation of aeronautical meteorological services to be monitored and, as necessary, facilitated to support the effective implementation of ASBU priority modules and the Asia/Pacific Seamless ATM Plan elements;~~
- c) ~~Identify Air navigation deficiencies in the field of aeronautical meteorology MET to be identified (which may require any necessary e.g., through systems performance monitoring to be facilitated) and, where necessary, propose appropriate corrective action proposed and facilitate the development and implementation of action plans by States to resolve identified deficiencies facilitated;~~
- d) ~~Review and update the APANPIRG list of Air navigation deficiencies in the field of aeronautical meteorology MET (as listed in the APANPIRG database) to be reviewed and, as necessary, updated to reflect the current situation;~~
- e) ~~Monitor Research and development, and trials and demonstrations in the field of aeronautical meteorology MET and other relevant areas to be monitored and, as necessary, facilitate the transfer of this information and expertise, as necessary, between States facilitated;~~

- f) ~~Make S~~specific recommendations ~~to be made~~, and develop guidance materials ~~developed~~, aimed at improving aeronautical meteorological services ~~by through~~ the use of existing and/or new procedures, facilities and technologies;
 - g) Review and identify ~~Inter-regional and intra-regional co-ordination issues in the field of aeronautical meteorology~~ ~~MET to be reviewed and identified~~ and, as necessary, recommend actions ~~recommended to~~ addressing those issues; and
 - h) Identify and progress ~~MET~~ environmental initiatives ~~related to aeronautical meteorology~~ ~~are consistently identified and progressed~~; and
- 10) ~~Draft Conclusions and Draft Decisions to be formulated relating to matters in the field of MET that come within the scope of the APANPIRG work plan.~~

3. Establishment of the MET SG

3.1. The Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) established the MET SG to assist in its planning and implementation work, charging MET SG with preparatory work on specifically defined problems in the field of aeronautical meteorology requiring expert advice for their resolution. APANPIRG also appointed MET SG as the 'parent' group for other contributory bodies working in the field of aeronautical meteorology for APANPIRG (ICAO, 2016).

4. Membership of the MET SG

4.1. Membership of the MET SG comprises experts provided by States, whether Members or not of the APANPIRG, International Organizations and bodies having experience in the provision of aeronautical meteorological information and services (ICAO, 2016).

5. Chairing and Secretary of the MET SG

5.1. The MET SG shall elect a Chairperson, and Vice-Chairperson if needed, from the experts provided by States. The maximum term of the Chairperson and Vice Chairperson is four years. The Secretary of APANPIRG will appoint the Secretary of the MET SG (ICAO, 2016).

6. Meetings of the MET SG

6.1. The Chairperson of the MET SG, in consultation with Members and the Secretary, shall decide the date and duration of meetings. As a rule, the MET SG should agree, at each meeting, on the date and duration of the next meeting and on a tentative schedule of future meetings (ICAO, 2016).

7. Record of Meetings of the MET SG

7.1. The MET SG shall record the proceedings of its meetings in the form of a Report or a Summary and submit the Report or Summary for review and consideration by APANPIRG. A meeting Report should cover completed action on any part of the MET SG work plan and outline the needs of MET SG for further directives or guidance from the APANPIRG to proceed in its work. Reports on meetings shall be of a simple layout and as concise as practicable and should normally cover:

- a) Short introduction;
- b) Summary of findings (presented in the order of discussion of the agenda items, including any proposals for action); and

c) Work plan and schedule for future meetings (ICAO, 2016).

8. Delegated authority of the MET SG

8.1. The MET SG may propose actions for further consideration by APANPIRG and record these in the MET SG Report as either draft Conclusions or draft Decisions of APANPIRG (ICAO, 2016).

8.2. Additionally, APANPIRG has empowered MET SG to adopt proposals for action on technical matters (especially those concerning guidance to States in the implementation of ICAO SARPs and global and regional plans) that do not have additional economic, environmental, inter-regional or political effects, which should be considered by APANPIRG. The MET SG shall record these in its meeting Report as Conclusions or Decisions of MET SG (ICAO, 2016).

9. Work Plan of the MET SG

Function	Detailed description of deliverable	Responsibility	Target date
1, 10	Progress report on MET SG deliverables including Draft Conclusions and Draft Decisions relating to matters in the field of MET that come within the scope of the APANPIRG work plan (submitted to APANPIRG/28)	MET SG Chair	Aug 2017
a)	Amendment proposal for APAC ANP Volume I and Volume II (submitted to APANPIRG/28)	MET SG Chair, Secretariat	COMPLETED Aug 2017
a)	Draft amendment proposal for APAC ANP to fulfil missing data in Tables MET	MET/S WG	Mar 2019 Jun 2018
a)	Draft amendment proposal for APAC ANP to clarify the MET-related implementation planning guidance in the ANRF and other parts of Volume III	MET/IE WG MET/S WG MET/R WG	May 2019 Jun 2018
a)	Amendment proposal for APAC ANP Volume II, Table MET II-2 to reflect current requirements for 30-hour validity TAF (submitted to APANPIRG/28)	MET/S WG (Task 7)	COMPLETED Aug 2017
a), f)	Version 2 of draft regional guidance material for tailored MET information supporting ATM operations	MET/R WG (Task 4)	COMPLETED Jun 2018
b), c)	Analysis of APAC Regional SIGMET test	MET/S WG (Task 1 and 3) MET/IE WG (Task 3)	Mar 2019 Jun 2018
b), c)	Analysis of APAC Regional OPMET-availability monitoring exercise	MET/IE WG (Task 1)	Mar 2019 Jun 2018
b), c)	Analysis of APAC Regional OPMET-timeliness, -compliance and -regularity monitoring exercises	MET/IE WG (Task 2)	Mar 2019 Jun 2018
b), g)	Analysis of APAC Regional VAAC backup tests	MET/IE WG (Task 4)	Mar 2019 Jun 2018
b), g)	Analysis of APAC Regional IROG backup tests	MET/IE WG (Task 5)	Mar 2019 Jun 2018
b)	Revised draft regional guidance material on MET information needed to support the elements of the APAC Seamless ATM Plan	MET/R WG (Task 3)	Jun 2018

Function	Detailed description of deliverable	Responsibility	Target date
c)	Analysis of APAC Regional SIGMET monitoring exercises	MET/S WG (Task 1)	Mar 2019 Jun 2018
b), c), g)	Final report on ICAO volcanic ash exercise APAC VOLCEX 18/01 (Papua New Guinea)	APAC VOLCEX/SG (Task 5)	TBD Jun 2018
b), c), g)	Final report on ICAO volcanic ash exercise APAC VOLCEX 18/02 (Indonesia/Sumatra)	APAC VOLCEX/SG (Task 6)	Jun 2019
b), c), g)	Final report on ICAO volcanic ash exercise APAC VOLCEX 19/01 (Solomon Islands, Tonga or Vanuatu)	APAC VOLCEX/SG (Task 7)	Jun 2019
b), c), g)	Final report on ICAO volcanic ash exercise APAC VOLCEX 19/02 (North-east Asia/affecting Republic of Korea)	APAC VOLCEX/SG (Task 8)	Jun 2020
b), c), g)	Final report on ICAO volcanic ash exercise APAC VOLCEX 20/01 (Philippines)	APAC VOLCEX/SG (Task 9)	Jun 2020
c), d)	Proposal to update the APANPIRG AN deficiencies database to add/remove deficiencies in the MET field	MET SG Chair, Secretariat	Aug 2018 Aug 2017
c), d)	Reporting form updates showing the status of implementation of corrective action for the resolution of AN Deficiencies in the MET field	MET/S WG (Task 2 and 6)	Mar 2019 Mar 2018
e), f), g)	First draft of input to the Regional SIGMET Guide to assist States in aligning cross-FIR-boundary SIGMET information	MET/R WG (Task 1) MET/S WG (Task 4)	Jun 2018
f)	First draft of input to the Regional SIGMET Guide on the use of objective criteria supporting the issuance of SIGMET information for thunderstorm	MET/S WG (Task 4)	Mar 2019 Jun 2018
f)	Progress report on implementation and testing of IWXXM exchange	MET/IE WG (Task 5)	Jun 2018
f), g)	ROBEX Handbook updates to support improved efficiency and effectiveness of the ROBEX scheme; develop new table indicating COMM links and status	MET/IE WG (Task 6)	Jun 2018; Mar 2019
g)	Information on ICAO provisions related to meteorological authority and quality assurance, cost recovery, competency, training and qualifications for meteorological service provision shared with States	MET SG Chair, Secretariat	Jun 2018
g)	Analysis of MET information used in the Region specifically to support ATM operations	MET/R WG (Task 2)	Jun 2018
g)	Plan for seminar on regional implementation of MET information to support ATM operations	MET/R WG (Task 5)	Jun 2018
h)	Environmental Issues Identify issues in the field of aeronautical meteorology related to environmental issues	MET SG Chair, Secretariat	Jun 2018

Function	Detailed description of deliverable	Responsibility	Target date
b), e), g)	IWXXM workshop Plan and conduct the IWXXM workshop	Secretariat, MET/IE Chair, MET SG Chair, Hong Kong China, Singapore	Nov 2018
f), g)	SIGMET Guide update Update the Regional SIGMET Guide to align with Annex 3, Amendment 78	MET/S WG (ad-hoc group)	Oct 2018
e), f), g)	SIGMET coordination activities in APAC Region Coordinate on the next steps to promote integration and expansion of SIGMET coordination activities among States/Administrations.	MET/S WG MET/R WG	May 2019