

3rd New Zealand Aviation Meteorology Symposium

Meeting Report

Date: 19 September 2019
 Venue: CAA Wellington
 Actions: Refer Appendix 1
 Agenda: Refer Appendix 2

Time: 0900-1600
 Host: CAA NZ
 Attendees: Refer Appendix 3

Discussion Summary

#	Item	Discussion/Action
1.	Opening and introductions	Mark Hughes, Deputy Director – Air Transport and Airworthiness, made the opening remarks, welcoming attendees on behalf of the Director who was not able to attend. Mark acknowledged the wide range of attendees, noted some of the challenges facing aviation and how wide, responsive collaboration on meteorological matters can lead to improved safety and economic outcomes.
2.	Actions Review	Refer Appendix 2
3.	Presentations	<p>The PowerPoint (PPT) presentations mentioned below will be made available on the CAA web site <i>Meteorology</i> pages under <i>Meteorology Symposium</i>. (refer to : https://www.caa.govt.nz/airspace-and-aerodromes/meteorology/met-developments/)</p> <p>Space Weather – Prof. Craig Rodger (University of Otago)</p> <ul style="list-style-type: none"> • Overview of what space weather is and how it can impact aviation – affecting GNSS and HF communications, satellite-based navigation, ATC services, as well as radiation effects on people and avionics for flights near the poles. • Additionally, a coronal mass ejection impacting the earth’s magnetosphere can induce currents on the ground, affecting power grids (eg “great magnetic storm” of Quebec 1989). • For solar flares, the understanding of the physics involved is still poor – forecasting of solar flares has a false alarm rate of around 10 for every success. Current focus is on “nowcasting”. • For coronal mass ejections, there is approximately a 5hr error in the timing of the arrival, but there will be around 1 to 1.5 days’ lead-time for the warning that it will impact the earth. Once the event arrives, there will be around 30-45min lead-time when warning on the how severe the impact will be. • Currently in a solar minimum now (sunspot cycle), with a solar maximum in around 7 years. However, some severe events have not been well linked to the solar cycle. <p>International MET Developments – Peter Lechner (Chair of ICAO MET Panel)</p> <ul style="list-style-type: none"> • Space weather advisory system under development – three SWX centres selected (US, PECASUS consortium, ACFJ consortium), each on duty for two weeks, then 4 weeks in backup operations. <ul style="list-style-type: none"> ◦ SWX advisories to be issued as necessary from 7 November 2019, similar format to VAAs but no accompanying graphic. • Regional Hazardous Weather Advisory Centre (RHWAC) system currently being devised, objective to provide globally harmonised, phenomena-based, hazardous weather information (not constrained by FIR boundaries). <ul style="list-style-type: none"> ◦ Initially for all SIGMET phenomena except VA, TC and radioactive cloud. ◦ Slow progress, politically challenging. Current timeline - around 5yr till operational. • International Airways Volcano Watch (IAVW) now working on provision of

		<p>quantitative volcanic ash product (allowing dose concentration) - timeline around 3-5 year until operational.</p> <ul style="list-style-type: none"> • IWXXM format MET data - a standard for METAR/SPECI, TAF, SIGMET, TCA, VAA, SWXA (also AIRMET) from 5 Nov 2020, other products to follow in future years. <ul style="list-style-type: none"> ○ “Text” based products to continue as a “standard” till 2026 (although possibly as early as 2024) - however, States can determine their requirements for text based products after this date. • MET in SWIM - roadmap in place globally, with discussions in NZ looking at how to implement SWIM here, working closely with Australian counterparts. See “NZ MET in SWIM” update for more information. <p>Pacific Update – James Lunny (MetService) and Paula Acethorp</p> <ul style="list-style-type: none"> • Significant outcomes of 17th Meeting of Regional Area Five (RA V-17) - WMO body, RA V covers the South Pacific across to Singapore <ul style="list-style-type: none"> ○ Regional conference to be organised, on the future of aeronautical meteorological service provision (likely 2020). ○ Development of a RA V AMDAR programme during 2020, to go live in 2021 ○ Re-establishment of a RA-V working group on Weather Services, to coordinate with ICAO and others in the provision of targeted assistance for RA V members • Significant outcomes of 5th Meeting of Pacific MET Council (PMC-5) - as proposed by expert panel Pacific Island Aviation Weather Services (PIAWS) Panel. PMC is a specialised subsidiary body of SPREP (Secretariat of the Pacific Regional Environment Programme). <ul style="list-style-type: none"> ○ PIAWS Panel include representatives from CAAs, IATA and IFALPA ○ Task team formed to address ICAO Air Navigation Deficiencies in MET field and to work on IWXXM capability of the Pacific states. ○ Development of a web portal to support issuing of VONA (Volcano Observatory Notice to Aviation) in the South Pacific ○ Inclusion of a PIAWS Panel member in the ICAO MET Panel group working on development of cost recovery recommendations <p>MET in SWIM Workshop Outcomes – David Wills (CAA – no slides)</p> <ul style="list-style-type: none"> • Session held during the afternoon of 18 September 2019, including technical experts from CAA, MetService, Airways, Aeropath, Bureau of Meteorology Australia and user representatives from Jetstar and OzRunways. • Aim to form a view on how MET products will be disseminated via SWIM services in New Zealand. <ul style="list-style-type: none"> ○ Start with existing products already available via AFTN and migrate these to SWIM before looking at new product sets (eg that combine data from different sources etc). • Looked at current capabilities and what the future state may look like, agreed a staggered implementation most appropriate. <ul style="list-style-type: none"> ○ CRV is an enabler for SWIM that can/should be utilised for international connections if possible • Noted that most users will not be able to receive MET products via AMHS connection, so using AMQP service or similar will be necessary when delivering IWXXM data to users. • Agreement that further work should continue under NSS SWIM subgroup. <p>MetService – Reflection and Realignment – Rob Harrison, Marcel Roux, Kevin Alder, Pete Lowe, Ray Thorpe</p> <ul style="list-style-type: none"> • Noted the changing face of meteorology service provision moving into the future – requiring innovation and progressiveness. • Currently reviewing aviation forecasting service, optimising forecaster time - in particular, looking at: <ul style="list-style-type: none"> ○ Smart automation of products
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		<p>considered to represent a safety risk</p> <ul style="list-style-type: none"> • Symposium discussion indicated that this is a widespread issue in GA operations, where apps are widely used but not always in conjunction with observations or certified data. <ul style="list-style-type: none"> ○ This is particularly potentially dangerous near significant terrain, which is not accurately modelled by “on-line” weather models and so in turn can have misleading wind information.
4.	Discussion Points	<ul style="list-style-type: none"> • Tim Hailes from the Bureau of Meteorology (BoM) Australia advised the meeting that the BoM has created aviation information brochures on what space weather is and how the advisory system will work. <ul style="list-style-type: none"> ○ http://www.bom.gov.au/aviation/data/education/space-weather.pdf ○ http://www.bom.gov.au/aviation/data/education/space-wx-advisories.pdf • Glenn Johnston (Jetstar) asked whether MetService would be engaging with the Bureau of Meteorology to collaborate in research and development related to aviation meteorology, to improve efficiencies across the two organisations. Marcel Roux (MetService) confirmed this was the case and that the details of how that collaboration would be progressed were currently being worked out.
5.	Breakout feedback - Current and future MET requirements of small operators	<p><u>Challenges</u></p> <ul style="list-style-type: none"> • Access – needing to log into a PC to access charts, compared to ease of accessing weather information via an app on a phone • Many information sources but operators don’t always choose to view the official forecast – why? <ul style="list-style-type: none"> ○ Apps are easy to use ○ They have visual appeal ○ Often free or low cost (however, not necessarily accurate) • New forecasts or weather stations come at a cost – marine weather forecasts are covered by the MOT contract, why not aviation? <p><u>Ideas</u></p> <ul style="list-style-type: none"> • Introduce “dynamic” graphical products – rather than having 6-hourly images, have something that is a higher temporal resolution and can be scrolled through • Use model data to create new visualisations <ul style="list-style-type: none"> ○ Being looked at by MetService currently for aerodromes, including verification of data. ○ Aerodrome meteograms (graphical timelines of data) or cross-section route forecasts ○ Rapid model updates • More locations for TAF or TAF-like products, to better support HEMS and other lifeline operations, as well as tourism operations (particularly West Coast South Island) <ul style="list-style-type: none"> ○ To be considered as part of domestic TAF review • Possible simple changes such as: <ul style="list-style-type: none"> ○ Adding features such as rivers on GRAFOR to help understand where weather is expected to be ○ Overlays on webcam imagery to help with determining cloud base or current visibility ○ Include observed/forecast visibility over 10km in METARs/TAFs for international aerodromes (but convert to 9999 for international dissemination, as for NZQN) • Consider access to forecaster • Consider partnerships with technology suppliers to get data to the pilot (eg Foreflight, OzRunways etc) • Focus on education in use of products and in limitations of model data <p><u>Agreed way forward</u></p>

		<ul style="list-style-type: none"> ○ Carry out user workshops to ascertain what the needs are, refresh ideas on how to display data and work with partners in technology to deliver data to the pilot. ○ Consider how the services can be provide <u>collaboratively</u> to ensure the safety of the aviation community. <p>Noted by Symposium: IWXXM allows the addition of extra value – moving to aerodrome observations (not simply METARs) which could supply all anemometer information, with data averaged at 1min, 3min and 10min, as well as high-resolution visibility information.</p>
6.	Breakout feedback – <i>Considerations for a cost recovery scheme in the NZZO.</i>	<ul style="list-style-type: none"> ● Noted that the future SWIM environment does not support the current cost recovery methods in NZ ● Group looked to what other States are doing – eg Eurocontrol, Australia. ● Asked does there need to be legislation to have one core provider – however, this is not expected to happen in the near future. ● Looking at getting support from operators to have a MET component on the Air Navigation Charge, currently managed by Airways. ● Plan: <ul style="list-style-type: none"> ○ MetService will create proposal on how this new charging system will work ○ Consider the benefits for industry ○ Go to industry with a plan early 2020, consultation during Jan-March, with implementation on the 1 July 2020. ● Considerations: <ul style="list-style-type: none"> ○ Leave the MOT contract as-is, covering GA access to information ○ Leave Defence contract as-is ○ Ensure transparency in costs ○ Consult with BARNZ, BARA, IATA ○ Consider providing information free to HEMS operations as a bonus <p>Noted by Symposium that this would remove current situation of some airlines subsidising others. Agreed by Symposium that a potential “phase 2” would look at cost recovery for Pacific States within the NZZO FIR.</p>
7.	Actions	Full list of actions in Appendix 1.

Next Meeting	
Date:	Tentative – Oct 2020
Place:	CAA, Wellington
Time:	Full day

Appendix 1 – Consolidated Actions and Updates

Mtg	Action / Decision	Description and comment	State	Who/Lead
1	7	Investigate and implement, if possible, access to Fiji Airways AMDAR. A 2-day meeting/workshop to coordinate AMDAR reporting in the Australia/Pacific region is being held week of 24 September 2019 in Singapore. The BoM, NZ Met and Fiji Met Service will be in attendance.	Open	MetService
1	8	Investigate the potential implementation and costs of meteorologist direct link to airport/ATM/airline operations. Trial underway with Qantas via conference call. WLG are keen for a similar trial for their new airport operations centre. Airways have expressed interest in a future embedded MET role as well. Resourcing for embedded MET at an airport is dependent on the wider review of aviation forecasting services/optimisation to free up forecaster time and/or a business case for extra resourcing for a combined airline ATM and airport requirement.	Open	MetService
1	9	Work with aerodromes to implement key MET input into A-CDM. To include runway condition and radar scanning concepts and costing. MetOps Display designed to incorporate various widgets including TALPA outputs, Radar, Lightning and Designated Weather Threat Matrices, based on individual Airport requirements. Planned to be operational mid-October 2019.	Open	MetService
1	11	Maintain watch on ICAO development of new Terminal Area Forecast approach to support TBO. No further updates available at this stage. Will be addressed in the future as part of ongoing reporting on International MET System developments – mostly likely from the work of WMO aviation working groups.	Closed	CAA
1	16	Implement a programme of investigation into the probable MET requirements of UAV/RPAS including low-level smaller aircraft through to unmanned heavy metal aircraft (eg B747 freighters) at cruising levels. MetService work underway with the Air, Land, Marine components of NZDF on current and future requirements for RPAS/UAV, as well as other entities such as CHC based Zephyr Airwork for current concept UAV designs & testing. MetOPS display has applications here as well for operational bases.	Open	MetService
1	18	Review the utility of TREND in context of operator need for short term forecast window on probable aerodrome conditions – noting the recent work completed by BoM in this regard Discussion document going through internal CAA policy review and is hoped to be available for external comments by the end of the year.	Open	CAA
1	19	Ensure that the various development programmes, including NSS, address the issues of IWXXM data storage and distribution within the SWIM environment – drawing on overseas developments and testing within the ICAO gambit. Airways, MetService and CAA are working together on a plan for trial exchange of IWXXM data over AMHS connections, leading to full implementation in 2020. Also – see overview of MET in SWIM workshop (item 5 in agenda).	Closed	CAA
2	1	Share the domestic TAF provision policy with industry for feedback, and progress its implementation. Work will be discussed as part of a wider review currently underway of aviation forecasting services provided and the new strategic approach MetService is taking with respect to delivery of future aviation services (see action 3/1).	Open	MetService
2	2	Progress the new air navigation based MET charging model in conjunction with Airways, in close liaison with CAA, recognising that a change to current legislation may be required. Rules issue raised within CAA regarding use of non-Part 174 MET information, given likely SWIM structure where international State provided data will not need to be passed on via local Part 174 provider. This has added outcome of	Open	CAA & MetService

Mtg	Action / Decision	Description and comment	State	Who/Lead
		affecting current cost recovery scheme. Refer Airlines Panel discussion in section 6 above.		
2	3	Consider a review of June domestic TAF issue and validity time changes – a mandatory update overnight may alleviate concerns of “old data”. Extension of validity period for the morning issue of the NZDN and NZNV TAFs from 12 to 15UTC. Any further review to TAF issue times and validity periods will be considered as part of a wider review of aviation forecasting services (see action 3/1).	Closed	MetService
2	4	Consider the feasibility of providing automated forecasts for some small aerodromes, with appropriate verification in place. MetService launched a new NWP verification tool in July, which is assessing the specific weather parameters that make up a TAF. Work to date is addressed under action 3/1.	Closed	MetService
2	5	Consider ways of improving utility of forecasts for GA operations, such as aerodrome specific change criteria for TAFs when aerodromes are significantly terrain influenced (eg NZMF), whether the visibility & cloud base in both TAFs & METARs can be made available as part of the domestic format TAF, and consider “local time” alternatives to UTC. (Note: local time forecasts may be an outcome of IWXXM format OPMET where users specify how they view the data). Dependent on the wider review of aviation forecasting services/optimisation for current and future regional requirements, particularly in the Northland and Wanaka/Alexandra/Milford/Queenstown regions. Kaitaia Airport is undergoing significant AWS upgrade. This will also be covered as part of current trial initiatives under way with Aeropath and requirements to provide access to MET data under licence to 3rd Party suppliers such as Oz Runways – tied in with tiered API project which is nearing completion. Work is addressed under action 3/1.	Closed	MetService, CAA & relevant GA organisations
2	6	Encourage better user/forecaster interactions and mutual understanding by involvement in events hosted by RNZAC, NZAWA and attending annual CAA instructor and examiner seminars. MetService attends the annual Walsh Memorial flying school and frees up 3 aviation forecasters to provide daily weather briefings. GRAFOR roadshows in 2018 lead to constructive user feedback with respect to the new product. Also resulted in some consultation with Air Milford and Airways on opportunities to improve the NZMF TAF for users.	Open	MetService & CAA
2	7	Consider possible MET products to support Westland GA/tourism community, keeping in mind appropriate cost recovery. Dependent on the wider review of aviation forecasting services/optimisation for current and future regional requirements. Further work to be addressed under action 3/1.	Closed	MetService
2	8	Consider providing more information on limitation of AWS sensors, for example 20km visibility limit to users of the observations. Explanatory information available under “help” section of MetFlight and available at: https://www.caa.govt.nz/meteorology/metar-auto/	Closed	MetService
2	9	Chair of the ICAO Meteorological Panel and Chief Meteorological Officer at CAA to approach relevant NZ government agency to facilitate a government level approach at the next South Pacific Forum. CAA Chief Meteorological Officer (CMO), MetService GM Science Strategy and MetService WMO Manager (former interim Manager, Aviation Weather Services) are now members of the Pacific Islands Aviation Weather Services (PIAWS) Panel, reporting to the Pacific Meteorological Council (PMC) – with CMO as vice-Chair, working collaboratively with Pacific Island	Closed	CAA

Mtg	Action / Decision	Description and comment	State	Who/Lead
		States on improving the provision of aviation meteorological information across the Pacific. The Panel is supported by both WMO and ICAO APAC office.		
2	10	Draft Terms of Reference (TOR) for MET Symposium to clarify span and intent of work. Draft Terms of Reference provided to attendees, no further additions or amendments suggested. TOR to be made available on https://www.caa.govt.nz/airspace-and-aerodromes/meteorology/met-developments/	Closed	CAA
3	1	MetService to continue to carry out a review of services to aviation, to ensure that services provided to the aviation community are optimised to support the safety and efficiency of aviation operations. As part of this, MetService are invited to review services to the GA, helicopter and small operator sectors, including conducting workshops, to ensure services provided meet the needs of those sectors, while keeping in mind MetService's obligations as an SOE.	Open	MetService
3	2	Progress on activities of the New Southern Sky SWIM Sub-Group (as related to MET) to be reported at the next MET Symposium	Open	CAA
3	3	CAA to undertake a review of current processes, as they relate to space weather advisories. CAA also to make available education material on space weather and its impacts, as well as the space advisory system and how users (in particular operators and ATC) may make use of those advisories.	Open	CAA

Appendix 2 – Agenda

#	Item	Covering	Presenter
1.	Opening and introductions	<ul style="list-style-type: none"> Opening Remarks Round table introductions 	Paula Acethorp CAA
2.	Open Actions - Status	<ul style="list-style-type: none"> Review of all open actions (refer Appendix 1 – updates to be provided ahead of time) 	Paula Acethorp CAA
3.	Space weather	<ul style="list-style-type: none"> What is “space weather” and what does it mean for aviation? 	Dr Craig Rodger – University of Otago
4.	Morning tea		
5.	International meteorological system developments and progress.	<ul style="list-style-type: none"> Brief overview of MET Panel developments 	Peter Lechner CAA (MET Panel Chair)
6.	MET in SWIM workshop	<ul style="list-style-type: none"> Brief overview of outcomes of previous day’s MET in SWIM workshop 	David Wills CAA
7.	Pacific MET Activities	<ul style="list-style-type: none"> Significant outcomes of the RA V-17 and PMC-5 meetings 	James Lunny -MetService Paula Acethorp CAA
8.	Part 174 Certificate holders: their experiences, issues, and future directions	<ul style="list-style-type: none"> MetService Airways Navigatus 	
9.	Networking lunch		
10.	Airlines	<ul style="list-style-type: none"> Parallel Panel discussion <i>Considerations for a cost recovery scheme in the NZZO.</i> 	Airline Chair
11.	GA/Training	<ul style="list-style-type: none"> Parallel Panel discussion <i>Current and future MET requirements of small operators</i> 	GA Chair
12.	Afternoon break		
13.	Report back	<ul style="list-style-type: none"> From Panel discussions 	Panel Chairs
14.	Review	<ul style="list-style-type: none"> Issues - identified Actions - allocated 	Paula Acethorp CAA
15.	Future meeting	<ul style="list-style-type: none"> Meeting management, next meeting. 	Paula Acethorp CAA

Appendix 3 – Participants

Aeropath	Matt Day	Trent Clarke			
Air NZ	Markus Kraettli				
Airways	Mike Haines	Ian Dore			
ALPA	Frank Usmar				
AOPA	Pat Lyford				
BoM	Tim Hailes	David Farr			
CAA	Paula Acethorp	Peter Lechner	David Wills	Scott Earley	Adrian Parker
	Carlton Campbell	Tom Gormley	David Oliver		
GNS Science	Natalia Deligne				
Jetstar	Glenn Johnston				
Kapiti Aero Club	Tony Quayle				
Ministry of Transport	Grace Xu				
MetService	Rob Harrison	Ray Thorpe	Marcel Roux	Ciaran Doolin	Amy Dreverman
	Peter Lowe	Norm Henry	Greg Reeve	James Lunny	DhiresH Hansaraj
	Humphrey Elton	Kevin Alder			
Navigatus	Geraint Bermingham	Stephen Hunt			
NZAWA	Dee Bond				
NZDF	Michael Williams				
OzRunways	Ellen Franklin				
University of Otago	Craig Rodger				