







"AT THE FRONTLINE OF WEATHER, CLIMATE, WATER, AND OCEAN ACTION IN THE PACIFIC"

SEVENTH MEETING OF THE PACIFIC METEOROLOGICAL COUNCIL (PMC-7)

"At the Frontline of Weather, Climate, Water, and Ocean Action in the Pacific"

17-19 September 2024, Warwick Le Lagon-Vanuatu Resort, Port Vila, Vanuatu

Agenda Item 9.1: Progress and Updates of the PIAWS Panel Activities

Purpose:

- To provide the Meeting with an overview of the activities of the Pacific Island Aviation Weather Services (PIAWS) Panel since the Sixth Meeting of the Pacific Meteorology Council (PMC-6), including activities related to capacity development, quality management and ICAO compliance.
- To emphasise the need for support for Pacific Island meteorological services in developing cost recovery schemes for services to aviation.
- To inform the Meeting of the new Co-Chairs of the PIAWS Panel.

Background:

The PIAWS Panel, established by the Third Meeting of the Pacific Meteorological Council (PMC-3) in 2015 to provide advice to PMC on matters relating to meteorological services to aviation including quality management, competency standards, capacity development, cost recovery, and exchange of meteorological information for aviation in the Pacific region.

The Panel has met twice since PMC-6, in May and August 2024. The Terms of Reference of the Panel is provided in Attachment A to this paper, with revisions as follows:

- Chairs of the Panel are to be elected for two terms (ie two PMC meetings) and sharing of a Chair role is now included.
- Sharing knowledge and expertise on observation networks and instrumentation requirements, as related to aviation meteorological services
- Inclusion of ICAO's Pacific Liaison Officer and the World Organization of Volcano Observatories (WOVO) as members of the Panel.

Mr 'Ofa Fa'anunu (Tonga) has presided as Chair of the PIAWS Panel since 2015 and has recently taken up a new role at SPREP as Manager of the Weather Ready Pacific (WRP) Programme. His leadership of the Panel has been much appreciated over this time and the Panel wishes him well in his new role.









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Two new co-Chairs were selected by the PIAWS Panel – Mr Laitia Fifita from Tonga and Mr Levu Antfalo from Vanuatu, while Ms Paula Acethorp was re-confirmed as vice-Chair, all for a term of three years, as per the Panel Terms of Reference.

PIAWS Panel activities:

Following the requests from PMC-6 relating to aviation meteorology, the Panel can report progress in all seven activities.

- Regarding the request for technical assistance for Pacific Island States in futureproofing their observation systems and forecasting tools to ensure the ability to comply with International Civil Aviation Organization (ICAO) provision of meteorological service and to meet current and future requirements for international aviation:
 - The Australian Bureau of Meteorology (BoM) has carried out a program of assistance, funded by the Australian Department Foreign Affairs and Trade (DFAT), in repairing or replacing automatic weather observing stations (AWOS) and upper air observing systems in Kiribati, Solomon Islands, Vanuatu, Tuvalu, Nauru, Fiji, Tonga, Samoa and Papua New Guinea.
 - MetService New Zealand is undertaking a review of the state of international aerodrome AWOS and upper air observing systems across the Pacific (for those countries with New Zealand aviation relationships), to provide a baseline for the Ministry of Foreign Affairs and Trade (MFAT) New Zealand to consider when funding future projects or improving the impact of current ones.
- Regarding the request for technical assistance for Pacific Islands States in capacity development and competency assessment activities:
 - The ICAO Asia and Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) Meteorology Sub-group (MET SG) ad hoc group on assisting with identification and resolution of deficiencies has been assisting Papua New Guinea by arranging a series of exercises in August and September 2024 to support the resolution of the SIGMET deficiencies. It is anticipated that these exercises will then lead into a volcanic ash exercise in early 2025, simulating the eruption of a Papua New Guinea volcano. This work will also benefit Nauru, which holds a SIGMET deficiency, given the Port Moresby Meteorological Watch Office (MWO) provides SIGMETs for the Nauru Flight Information Region (FIR).
 - ➤ The AeroMetSci Webinar series addressing turbulence and airframe icing related issues was delivered to RAII / RAV on 5 December 2023. The news item









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is available here: https://community.wmo.int/en/activity-areas/aviation/news/2024-04-09 (includes a link to the RA II / RA V summary).

- While not directly related to the provision of aviation meteorology in the Pacific, the following WMO activities and resources contributed to the wider aeronautical meteorological service provision:
 - ✓ RA V <u>Training course on Tropical Cyclones</u> was conducted in Nadi, Fiji, 16-20 October 2023
 - ✓ WMO RA II Aeronautical Meteorology Webinar 2024 delivered on 7 May 2024 and later uploaded into the WMO Aviation Moodle Training Portal here.
 - ✓ The <u>Aviation Training Moodle Platform</u> continues to act as a go-to for self-serve training offerings. The site is managed by the WMO SERCOM SC-AVI Expert Team on Education, Training and Competencies.
- Regarding the request for technical assistance for Pacific Islands States who are providing Terminal Aerodrome Forecasts (TAFs) and need help to set up suitable automated verification systems:
 - The Australian Bureau of Meteorology (BoM) provided an overview and demonstration of the BoM's TAFs Verification Service to show what's involved in establishing and operating a forecast verification service for TAFs including the key inputs required to perform the verification (e.g. TAFs and METARs preferably both manual and automated).
- Regarding the requests for funding assistance for the training of full-time Quality Management (QMS) Practitioners/QMS Auditors and Lead Auditors and extend the training to include Safety Management System (SMS); establishment of a mentoring/twinning approach to the development of an integrated quality and SMS for Pacific Island States' NMHSs; and assistance to carry out gap analysis of QMS in the Pacific Island States' NMHSs:
 - Solomon Islands QMS Technical Assistance (TA) Expert has assisted Kiribati Meteorological Service (KMS) on the QMS/SMS/Part 174 under the mentoring/twinning approach, funding support from BoM through the International development support for Pacific Aviation.
 - The BoM International Development Program has carried out a program "Developing and Implementing a Quality Management System (QMS) for NMHSs", funded through the Australian DFAT's Partnerships for Aviation Program. In-country workshops, including an ISO 9001 gap analysis, were carried out for Meteorological Services of Kiribati, Papua New Guinea and









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Samoa. Guidance was also provided to Samoa Meteorological Division and Papua New Guinea National Weather Service (PNG NWS) on Part 174 certification. In addition, internal auditor training was conducted for participants from these three States in May 2024, with follow up lead auditor training in June 2024, meaning the Pacific region now has an additional 12 internationally recognised Lead Auditors. Full details of this assistance are provided in Attachment B to this paper.

- Requested New Zealand to progress concept for a 'Volcanic Observatory Notification for Aviation (VONA) Portal' that will allow Pacific Island State volcano observatories (SVOs) to create and issue VONA:
 - The VONA Portal concept has now been approved for funding by New Zealand's Ministry of Transport and is now being developed by MetService New Zealand. It is anticipated that it will be available in 2025, when Pacific States with active or potentially active volcanoes will be invited to have their State volcano observatories participate in training to use the Portal.
 - Note currently the only Pacific Island State with a State volcano observatory designated in the ICAO APAC air navigation plan to provide VONA is **Papua New Guinea**, with an update underway to include Hawai'i Volcano Observatory (for Northern Mariana Islands and American Samoa). Pacific States with active or potentially active volcanoes should ensure their Civil Aviation Authority (CAA) coordinates with their volcano observatories to request an update to the ICAO APAC air navigation plan list of designated SVOs¹.
 - ➤ The Panel recognised the need for coordinating with the World Organization of Volcano Observatories (WOVO) for this work and has agreed to invite Chair of WOVO (from GNS Science NZ) to future Panel meetings to assist in this coordination.

As previously advised to the PMC-5 meeting, the PIAWS Panel Task Team on ICAO compliance has completed its assigned activities and the Task Team is disbanded. The Panel is now working closely with relevant groups under the ICAO APANPIRG MET SG to progress further improvement in deficiency resolution and ICAO Meteorological Information Exchange Model (IWXXM) compliance.

Members of the Panel have worked closely with the MET SG in its activities, as follows:

¹ Refer to Table MET I-1 State Volcano Observatories in ICAO APAC ANP Vol I here.









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- Members have contributed to the development of guidance material for organising and running meteorological exercises and improving the guidance on identification and resolution of deficiencies in the meteorological field. Both documents are available on the ICAO APAC e-document site², under the MET tab.
- The MET SG ad hoc group on deficiencies has worked with Papua New Guinea on a SIGMET exercise series, in support of gathering evidence to assist in resolving related deficiencies.

Cost recovery activities have also been progressed in the last year, by a WMO consultant with assistance from Civil Aviation Authority Fiji (CAAF), Fiji Meteorological Service (FMS) and other stakeholders in developing an FIR-based cost recovery system for aviation services. The project is in its final stage.

The Panel would like to stress the need for wider discussions on cost recovery within the region, so that each State providing aviation services can learn from Fiji's experiences and develop similar systems. Further, the Meeting should note that for FIRs where there are multiple embedded States, there should be consideration of mechanisms for cost recovery via air navigation charges for all aeronautical meteorological services provided within (including State volcano observatory services to aviation), from both overflights and flights directly to the aerodromes of those embedded States. However, to strengthen the mandate for cost recovery for aviation meteorological services, the Panel would also like to stress to the Meeting the importance of Part 174 certification.

The Panel is pleased to inform the Meeting that the Fiji Meteorological Service (FMS) has continued to progress its work in developing service level agreements (SLAs) with the meteorological services for other Pacific States, for which it provides aviation meteorological services. The Panel has encouraged FMS and relevant States to continue with this work and to also review the services currently provided to ensure that they are meeting the needs of the users in the region, without providing an unnecessary addition to the workload of FMS aviation forecasters.

Coordination by the Panel with the WMO Regional Area 5 Expert Team on WMO-IATA Collaborative AMDAR Programme (ET-WICAP) has continued, with the Lead for ET-WICAP (Mr Doug Body, Australia) advising that the ET would welcome new members, to help progress its work. The Panel would appreciate the Meeting's consideration of this request, noting the importance of AMDAR data to both meteorology (including SIGMETs).

² https://www.icao.int/APAC/Pages/eDocs.aspx









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Importance of QMS and SMS

There remains a strong need for assistance in both QMS and SMS development and ongoing improvement. The excellent work undertaken by the BoM in coordination with Kiribati, Samoa and Papua New Guinea has been very much appreciated by the PIAWS Panel, with a strong desire to see the activities extended to other Pacific States.

QMS is an ICAO Annex 3 requirement, therefore it is required by all Pacific States providing a service to international aviation. Further, it is a necessary building block in the journey to an effective SMS – a requirement for Pacific States that have adopted the New Zealand Part 174 civil aviation rule.

Further, the PIAWS Panel proposes that any new project undertaken in the Pacific should have a requirement for a QMS approach for its undertaking.

The meeting is invited to refer to the Working Paper under Agenda Item 9.4 for specific information and recommendations for activities on these topics.

Recommendations:

The Meeting is invited to:

- Note the activities of the PIAWS Panel and express appreciation to the outgoing Chair, 'Ofa Fa'anunu (Tonga) for his leadership of the Panel.
- **Note** Levu Antfalo (Vanuatu) and Laitia Fifita (Tonga) as the new co-Chairs of the PIAWS Panel, and Paula Acethorp (New Zealand) as continuing vice-Chair.
- Endorse the continued activities of the PIAWS Panel and the revised ToR as presented in Attachment A.
- **Encourage** States to ensure QMS principles are embedded within projects to improve the provision of aviation meteorology.
- **Recommend** Fiji and the relevant States finalise the service level agreements for the provision of aeronautical meteorology as soon as possible.
- **Recommend** the PMC to consider the request for additional members for the ET-WICAP, nominating any new members directly to Mr Doug Body, Australia.
- Request assistance for Pacific States to investigate cost recovery for aviation services via air navigation charges.









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Attachment A – Terms of Reference of the PIAWS Panel

Pacific Meteorological Council (PMC) Pacific Islands Aviation Weather Services (PIAWS) Panel

Terms of Reference

1. Introduction and Purpose

The Pacific Islands Aviation Weather Services (PIAWS) Panel was established by the Third Meeting of the Pacific Meteorological Council (PMC-3) in 2015 to serve in the capacity of an advisory body to the Pacific Meteorological Council (PMC) on matters relating to meteorological services to aviation in the Pacific region, implementing specific activities, as directed by the PMC.

2. Roles and Responsibilities

- a) Follow up on the resolutions, decisions and recommendations requests of the PMC, as directed to the PIAWS Panel;
- b) Collaborate with relevant World Meteorological Organization (WMO) programme of services for aviation and the Regional Association V (South-West Pacific) Working Group's Expert Teams on Services for Aviation (ET-AVI) and Expert Team on WMO-IATA Collaborative AMDAR Programme (ET-WICAP), as necessary, to ensure meteorological services to aviation are regionally coordinated and sustainable in their delivery, supported by appropriate observing networks, data sharing, and capacity development;
- c) Collaborate with the International Civil Aviation Organization (ICAO) Asia and Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) Meteorology Sub-Group (MET SG), their respective working groups, as necessary, to ensure meteorological services to aviation delivered by Pacific Island States respond to the needs of the region and are in compliance with applicable ICAO standards, recommended practices and guidelines;









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- d) Collaborate with the Pacific Aviation Safety Office (PASO) with the aim of promoting the importance of enhanced meteorological services to aviation and their contribution to safety and efficiency of air transport in the Pacific region;
- e) Facilitate the sharing of knowledge, experience and technology among members, particularly in the areas of:
 - Competency standards;
 - Observation networks and instrumentation requirements, related to aviation meteorological services
 - Capacity development of Aeronautical Meteorological Observers and Forecasters (AMOs/AMFs);
 - Meteorological data production and exchange;
 - Quality management system implementation, in conformity with the ISO 9001: 2015;
 - New Zealand Civil Aviation Rule (CAR) Parts 174 and 100) and national aviation regulation compliance and certification;
- f) Collaborate with members of the PMC to develop a regional roadmap for phased improvements of meteorological services to aviation, addressing Pacific Island States and region priorities related to meteorological services' needs for aviation;
- g) Establish, when appropriate, task teams within the PIAWS Panel to implement specific time-bound tasks considered important or urgent by the Panel or PMC to address the most urgent needs for meteorological services to aviation of the Pacific Island States and region; and
- h) The regular reporting to PMC members on the progress of PIAWS Panel.

3. Membership

The PIAWS Panel core membership comprises of experts from the following countries and organizations: Australia, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Kiribati, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, USA, Vanuatu, SPREP, USP, WMO, WOVO, PASO and ICAO APAC Regional Office (including the Pacific Liaison Officer), but at the same time it remains open-ended to allow for other PMC members to volunteer their experts and experts from other organizations to participate in PIAWS Panel's activities.









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4. Working Arrangements

- a) The PIAWS Panel will elect a Chair and vice Chair for <u>twoa</u> term<u>of three yearss</u> <u>(ie two PMC meetings)</u>. <u>This may extend to co-Chairs.</u>
- b) Meetings will be held at least twice a year, with virtual meetings as appropriate. The PIAWS Panel may invite experts either from its PMC members or related organizations to the Panel's meetings and discussions.
- c) Meetings of PIAWS Panel shall be coordinated and convened by its Chair, with the support of SPREP/WMO/Pacific Meteorological Desk Partnership (PMDP).

5. Revision and Approval of ToR

The PIAWS Panel will keep its ToR under review and will update, and then submit to PMC for consideration and approval.











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Attachment B – Project Update: Developing and implementing a Quality Management System (QMS) for National Meteorological and Hydrological Services (NMHSs)

An Australian Bureau of Meteorology international development initiative to support of Pacific Aviation:

Background: The Australian Bureau of Meteorology (BoM's) International Development Program has supported Pacific Island NMHSs in their aviation meteorological capacity development through Australian Department of Foreign Affairs and Trade (DFAT's) Partnerships for Aviation Program (P4A). With support from the Bureau, each NMHS was asked to identify where their greatest capability gaps (e.g. infrastructure, forecaster training, support for QMS) and they were then asked to prioritise these in order of importance. The Bureau then worked with each NMHS to tailor an individual Activity Plan based on the order of priority provided and the available budget envelope for the country. The Bureau did not 'select' countries for QMS training but rather asked the Directors and staff at each NMHS to articulate their particular aviation capacity development needs at the time and as a result, some countries prioritised QMS training (e.g. Kiribati, Samoa) whereas others choose to focus on infrastructure, or data processing or forecaster training. It should be noted that the Papua New Guinea National Weather Service (PNG NWS) is not listed under the countries participating in P4A however the Bureau has a new bilateral, Australian DFAT funded, Meteorological Twinning Arrangement with the PNG NWS. Following a similar prioritisation exercise, QMS training was prioritised by PNG NWS. The Bureau decided to combine QMS training for all three countries (regardless of the program they are funded under) in order to strengthen regional cooperation and collaboration in QMS moving forward. The current phase of P4A runs until June 2027 and all funds have been fully committed to existing Activity Plans for each country. No other countries in the list above prioritised QMS training above other capacity development activities therefore there is no further QMS training planned under P4A. Should a second phase of P4A be developed (post-2027), the Bureau will seek to repeat the identification and prioritisation exercise, and this will be an opportunity for NMHSs to consider prioritisation of QMS training for aviation in the future.

Purpose: To support international development activities with the meteorological services, under the Australian DFAT funded activity Support for Aviation Weather Services for Kiribati, PNG and Samoa.

Objectives: To conduct in-country workshops including an ISO 9001 gap analysis for Kiribati, PNG and Samoa Meteorological Services. Each workshop aimed to provide insight into the









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current status of the NMHS's management systems. A gap analysis findings report with proposed remedial actions was to be provided that includes quality management tools and resources to enable the commencement of the development of a QMS for each of the NMHSs.

Key achievements:

- 1. An ISO 9001 gap analysis was conducted on each of the NMHSs and they were provided with a comprehensive ISO 9001 gap analysis findings report that clearly identified proposed remedial actions.
- 2. The findings represented only those clauses which were either not met or only partially met the requirements of a specific clause.
- 3. The proposed remedial actions were recommended for the identified gap(s) that exist between the ISO 9001:2015 Standard and the current NMHS management system. It was emphasized that it is imperative that a NHMS officer be assigned to (and accountable for), each proposed remedial action together with a projected date of completion.
- 4. Wherever possible the findings were harmonised to provide a holistic picture of the conformance of the NMHS to the ISO 9001:2015 Quality Management Standard.
- 5. It should be noted that the initial gap analysis presents only a broad assessment of the NMHSs management systems relative to the requirements of ISO 9001:2015. The formal internal audit process will provide in-depth assessments which clearly demonstrated evidence of conformity or otherwise.
- 6. Focused "brainstorming" activities were performed to develop an initial framework for: an environmental scan, a stakeholder register, a risk register and a process matrix for the NMHSs.
- 7. A broad suite of quality management tools and resources were also provided to the NMHSs upon which to build their quality management systems. These included but were not restricted to:
- Environmental scan
- Process controls matrix
- Risk register
- QMS change notice
- Objectives and KPI's (Key Performance Indicators)
- Stakeholder register









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- External provider register
- External provider dashboard
- ISO 9001 gap analysis findings report
- Quality management Review Meeting Agenda / Minutes
- Non-conformance Register
- Quality Policy Examples

Civil Aviation Rule Part 174 – Aviation Meteorological Service Organisation – Certification and Operation:

A presentation was provided to the Samoa Meteorological Division (SMD) on an integrated management system could be achieved and how Part 174 integrates with the ISO 9001 QMS. It was clearly demonstrated how the requirements of both complement each other to establish an integrated management system. It stimulated considerable discussion on the current status of the SMD Part 174 submission to the Samoa Civil Aviation Authority.

The PNG NWS was finalising their Part 174 submission to the PNG Civil Aviation Authority. The project team (Helen Tseros & Bryan Boase) took the opportunity to conduct a half-day session to assist in the completion of Part 174 submission and to highlight the value of an integrate approach. The session, and its real-time practical application, clearly demonstrated how the requirements of an ISO 9001 QMS not only complement but adds considerable value to a Part 174 submission.

Footnote: Helen and Bryan are co-authors of WMO-No.1100 Guide to the Implementation of Quality Management Systems for National Meteorological and Hydrological Services and Other Relevant Service Providers (e. 2017). They have been approached by the WMO Head of Services for Aviation, to undertake a review and update, to reflect the "new" ISO 9001:2025 Standard to be released in 2025. The update will also include additional tools and resources that they have developed since 2017. They have agreed to do it once the ISO 9001:2025 Standard has been released. They are also in discussion with the Head of Services to Aviation, to develop and include a section within WMO-No. 1100, that addresses integrated management systems and in particular, Safety Management Systems and Part 174 for those WMO Members who deliver aviation weather services under that rule.

Internal Auditor Training: An internal auditor training workshop was conducted in Nadi, Fiji from the 20 – 24 May 2024. It provided training for 12 participants – 4 each from the Kiribati, PNG and Samoa NMHSs. The workshop training aligned with the guidance provided by *ISO* 19011:2018 Guidelines for auditing management systems. It provided an introductory and holistic view of internal auditing focussing on theoretical aspects and provided the opportunity for the practical application of internal auditing processes applicable to all









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management systems. All 12 participants were successful in the completion of the formal assessments and received a certificate of attainment from Exemplar Global who are a worldwide training organisation.

The course participants were trained to:

- Interpret and apply the requirements of a management system as it applies to the context of the organisation, audit objectives, criteria, and scope of the audit;
- Plan the audit, develop schedule, checklists, sampling plan, and other work documents;
- Execute the audit professionally and efficiently observe work practices, review documented information, interview relevant personnel;
- Collect and evaluate evidence, report non-conformities, and verify corrective action;
 and
- Communicate effectively while respecting confidentiality, security, personal, and proprietary information.

The successful completion of the internal auditor training provided the participants with the prerequisite to undertake lead auditor training.

The overall formal feedback from participants pertaining to the course content was very positive.

Lead Auditor Training: A Lead Auditor training workshop was conducted in Nadi, Fiji from the 17 – 21 June 2024. It provided Lead Auditor training for the 12 successful participants from the Internal Auditor training that was conducted in May 2024. The aim of the course was to provide participants with the knowledge and skills required to audit management systems in accordance with the guidelines outlined in *ISO 19011:2018 Guidelines for auditing Management Systems*. The workshop concentrated on the comprehensive training in the theory and practice of leading a quality management system audit based on ISO 9001:2015; and the attainment of a practical understanding of the responsibilities of a lead quality auditor, and the techniques and methodologies to effectively lead a QMS audit.

All 12 participants were successful and received a Certificate of Attainment from the international training organisation Exemplar Global.

The overall formal feedback from participants pertaining to the course content was very positive.

Importantly, the region now has a core of 12 internationally recognised Lead Auditors. They now have the opportunity to apply their newly acquired skills and in doing so, add value to









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the delivery of aviation meteorological services whilst providing a significant contribution to meeting international regulatory requirements (ICAO Annex 3) and Civil Aviation Authority Part 174 nationally for their NMHS.

