COMNAP Antarctic Aviation Workshop 2022
15 February–15 March 2022
FINAL WORKSHOP REPORT
18 March 2022

Contents

0.0 Background

0.1 Promoting operational safety in Antarctica is a key priority for COMNAP. In regards to air operations and air safety there is continuing opportunity to discuss increase in activity, changes in communications capabilities and improvements in technologies.

0.2 At COMNAP Annual General Meeting (AGM) XXXI (July 2019), the Air Operations Expert Group discussed the outcomes of the Antarctic Treaty Consultative Meeting (ATCM) XLII (2019) focussed discussion on aviation. The ATCM had accepted an offer from Australia to host a COMNAP Antarctic Aviation Workshop in Hobart, Tasmania, Australia, in 2020, and requested COMNAP to provide advice back to ATCM XLIII (2020) to assist ATCM decision-making in regards to aviation safety.

0.3 A COMNAP project on “Antarctic Aviation” was prepared and presented to the COMNAP

Executive Committee (EXCOM) in August 2019. The project was led since inception by Paul Sheppard (USAP), Air Operations Expert Group Leader, and initially had oversite by COMNAP Vice Chair John Guldahl (NPI). Together, with the COMNAP Executive Secretary, Michelle Finnemore, they formed the Aviation Project Steering Committee.

0.4 The project had four outputs, including output 4 to convene the Antarctic Aviation Workshop. COMNAP began planning with the Australian Antarctic Division to host the COMNAP-convened Antarctic Aviation Workshop on 30–31 July 2020. The Steering Committee and the Workshop Organising Committee guided planning and programming for that workshop and an open invitation to all those involved in Antarctic aviation was distributed.

0.5 An action item from the COMNAP AGM (2019) asked "All national Antarctic programs to consider the COMNAP project related to air operations/aviation and to nominate to the Air Operations Expert Group Leader (Paul Sheppard) technical air operations/aviation experts to participate in the project."

0.6 Due to the global pandemic, the workshop was cancelled for 2020, was rescheduled for 2021 in Toyama, Japan, and cancelled again due to the continuing pandemic. In September 2021, the project Steering Committee recognised that while an in-person workshop was preferred, the on-going pandemic meant that a virtual workshop was recommended. EXCOM accepted the recommendation and planning began for the virtual workshop to take place from 15 February 2022 through 15 March 2022.

0.7 This report reflects the substantive outcomes from the workshop as a record of output 4.

1.0 Objective

1.1 The objective of the workshop was to present and share information in regards to current safety in air operations issues as required by COMNAP Members, for the Antarctic community, and in response to specific requests by the ATCM XLII (2019) & ATCM XLIII (2021). The outcomes will be used to update and strengthen best practice advice on Antarctic aviation matters.

2.0 Workshop Organising Committee

2.1 In addition to the project Steering Committee, the workshop is the result of contributions from many people across the Antarctic community. The Workshop Organising Committee was:

Julio Bardesio, Flight Safety Director Uruguayan Air Force (FAU)
Sergio Pablo Bruno, Commodore Air Component Joint Antarctic Command (COCOANTAR) Argentina
Miguel Figueroa, Head Antarctic Division Chilean Air Force (FACH)
John Guldahl, DMNAP Norwegian Polar Institute & EXCOM oversite of the project to August 2021
Michelle Rogan-Finnemore, COMNAP Executive Secretary & EXCOM oversite of the project from August 2021
David Rootes, Partner Environmental Logistics and Sales Antarctic Logistics & Expeditions (ALE)
Paul Sheppard, Leader COMNAP Air Operations Expert Group & US Antarctic Program
Charlton Clarke, MNAP Australian Antarctic Division (to August 2021)
Santjie White, Mission Coordinator Aeronautical Rescue Co-ordination Centre (ARCC) South Africa (to December 2021)

3.0 Workshop Format

3.1 The online workshop consisted of three distinct parts: A. Distribution of a core set of key questions that was circulated to the Air Operations Expert Group, through each COMNAP MNAP, to each Antarctic Flight Information Manual (AFIM) Point of Contact, and by way of the Antarctic

Aviation project webpage with responses/feedback invited to all or some of the questions (from 8 February–10 March 2022). B. Online presentations that could be viewed on demand/at any time (15 February–15 March 2022) by way of YouTube; and C. Online plenary session held by zoom at UTC 15 March 1100–1230 hours UTC.

3.1 A. Core Set of Questions

Following the themes of Safety, Communications, Technology and Regulatory Review, there were eighteen questions asked of the community, we referred to these during the project as the "core set of questions". Appendix 3 is the core set of questions. Responses were received and collated by the project lead and were presented and explored as the focus of the plenary workshop session.

3.1 B. Online Presentations

On 15 February 2022, the workshop opened to all registrants (Appendix 1) by way of the COMNAP YouTube Channel, using the Antarctic Aviation Playlist. Only those who had registered for the workshop could subscribe to view the presentations anytime from 15 February through 15 March 2022. There were fifteen presentations in total and as of time of report writing, there had been 636 views of the presentations. The presentations were:

i. "COMNAP Products: data collection, management, revisions and distributions" (Uploaded on 31 January 2022) - Andrea Colombo, COMNAP Secretariat

ii. "Recommendation for COMNAP Best Practice Additional to AFIM on Position Reporting" (Uploaded on 31 January 2022) - Gary James, Office of Polar Programs US National Science Foundation

iii. "Transponder Landing System (TLS) Update" (Uploaded on 31 January 2022) - Gary James, Office of Polar Programs US National Science Foundation

iv. "Remotely Piloted Aircraft Systems Transponder Recommendation" (Uploaded on 31 January 2022) - Gary James, Office of Polar Programs US National Science Foundation

v. "Traffic Collision Avoidance System (TCAS)" (Uploaded on 31 January 2022) - Paul Sheppard, Office of Polar Programs US National Science Foundation

vi. "The Ins & Outs of ABS-B: An introduction and its role in future Antarctic aviation programs" (Uploaded on 15 February 2022) - Brian Crocker & Michael Whitley, Kenn Borek Air

vii. "Boulder Clay Runway Update" (Uploaded on 21 February 2022) - Gianluca Bianchi Fasani, Italian Antarctic Program ENEA

viii. "Dronning Maud Land Air Network (DROMLAN)" (Uploaded on 21 February 2022) - Christine Wesche, Germany's Alfred Wegener Institute (AWI) Helmholtz Centre for Polar & Marine Research & Co-Chair DROMLAN

ix. "Sustainability Principles in Antarctic Aviation" (Uploaded on 28 February 2022) - Yeadong Kim & Deneb Karentz, Scientific Committee on Antarctic Research (SCAR)

x. "An Overview of IAATO Operator Air Activities" (Uploaded on 3 March 2022) - Lisa Kelley, International Association of Antarctica Tour Operators (IAATO)

xi. "Safe Transport of Dangerous Goods" (Uploaded on 7 March 2022) - Julio Bacchino Bardesio, Uruguay Air Force

xii. "Using ADS-B for flight tracking and coordination in Dronning Maud Land" (Uploaded on 11 March 2022) - Sven Lidström, Norwegian Polar Institute

xiii. "Ground Support Assets for Chinese Antarctic Aviation Operation" (Uploaded on 14 March 2022) - Xuyu Cheng, Polar Research Institute of China

xiv. "Survival Equipment on Aircraft" (Uploaded on 14 March 2022) - Rod Arnold, British Antarctic Survey

xv. "Alfred Wegener Institute (AWI) Aircraft Operations" (Uploaded 18 March 2022) - Daniel Steinhage, Germany's Alfred Wegener Institute Helmholtz Centre for Polar & Marine Research

Brief summaries of these presentations can be found at Appendix 2. In addition to the YouTube video of each presentation, the PowerPoint files were shared with workshop registrants by way of Dropbox. They will be archived by COMNAP for future reference and referral with the presenters' permissions.

3.1 C. Plenary Session

On 15 March 2022, the 1.5 hour workshop plenary session was held. The workshop was open to registrants and registration was open to any member of the Antarctic Treaty community, governmental and non-governmental alike.

The Agenda for the plenary session was:

1. Welcome/Opening remarks - Michelle Finnemore

2. Introduction/Overview of Workshop Presentations - Paul Sheppard

3. Thematic sessions - Paul Sheppard
    a. Safety
    b. Technology & Communications
    c. Regulatory Review

4. Way Forward/Key outcomes - Paul Sheppard, John Guldahl & Michelle Finnemore

5. Conclusion/Close - Michelle Finnemore

4.0 Workshop Outcomes

4.1 Workshop outcomes are gathered from the presentations' observations, from the responses to the core set of questions and from the comments and discussion during the plenary workshop session.

4.2 There were seventeen recommendations for consideration by the workshop (as presented and shared onscreen in "3 PSheppard FINAL COMNAP Antarctic Aviation Workshop Presentation"). Those recommendations are:

Recommendation 1: All aircraft must operate with transponders turned on while operating in the Antarctic Treaty area.

Clarification was made that all aircraft (rotary-wing and fixed-wing) have "basic" transponders, but that often those transponders are not switched on/turned on by the pilot. It is considered critical that these transponders are turned on at all times while operating in the Antarctic Treaty area as it provides at least a minimal level of flight awareness/deconfliction and informs inflight decision-making. Even in areas of little to lite flight activity.

After discussion, there was general support for sending the advice that all aircraft turn on (mandatory) their transponders in "Mode C" for altitude reporting to the ATCM for consideration by way of a COMNAP Working Paper and also for placing a notice in the AFIM.

Recommendation 2: All piloted aircraft must have either TCAS or ADS-B in.

Traffic Collision Avoidance Systems (TCAS) are already mandated by the International Civil Aviation Organization (ICAO) for large aircraft. TCAS technology ranges from "basic" to "advanced" with costs increasing with advances. TCAS is highly recommended in all aircraft.

Recommendation 3: All Remotely Piloted Aircraft Systems (RPAS) and balloons (operating beyond visual range) should have ADS-B out.

There was recognition that having visibility of all aircraft in operation, especially in areas where the airspace is used by various entities and with various aircraft, that mandating for all RPAS and balloons to have ADS-B out installed and working would be a distinct safety advantage. There was general support for this and the recommendation will be considered by the RPAS Working Group for inclusion in the next revision of the *COMNAP Antarctic Remotely Piloted Aircraft Systems (RPAS) Operator's Handbook*.

Recommendation 4: All aircraft operators must communicate directly will all potential alternate airfields prior to take-off.

There was discussion in regards to the use of the word "potential". Clarity of language was needed. Strictly speaking, the terminology is "primary", "alternate" and "emergency" airfields. This recommendation was supported with the following rephrasing: "All aircraft operators to communicate directly with all primary and alternate airfields and their operators prior to take-off." This will be amended in AFIM Appendix 2. In addition, to improve standard reporting, Appendix 2 of AFIM will also be amended to include standard departure and reporting position templates, based on those established by ICAO, for ease and standardization of information exchange.

With increased air activity there is an increased expectation from some operators that airfields in the Antarctic Treaty area are readily available for use. This is not the case as most airfields are not personned year-round, may not have facilities associated with them, and may not be suitable as an alternate or emergency runway. Managing this expectation should start with the competent authorities permitting process which should include consideration of safety of the proposed activity. This advice will be passed to the ATCM for their consideration by way of this workshop report.

The concepts of Primary Air Information Station (PAIS) and Secondary Air Information Stations (SAIS) as first proposed by the Meeting of Experts on Air Safety (1988) and for the Traffic Information Broadcast by Aircraft (TIBA) as per ICAO Annex 11 are all still considered relevant as stated in ATCM Resolution 6 (2021) and as contained in the AFIM. This advice will be submitted to the ATCM in

regards to their continuing review of ATCM Resolution 6 (2021) by way of the COMNAP Working Paper.

Recommendation 5: Any country permitting a one-time unusual flight, (expedition or adventure) must notify and receive pre-approval from all primary, alternate and possible emergency airfields.

RCCs also noted the usefulness of knowing such information in advance and added that the RCCs can often offer pre-flight advice and guidance in relation to SAR aspects of any requests to the permitting authority.
This is a recommendation to Parties and their competent authorities. This advice will be given to the ATCM for their consideration by way of this workshop report.

Recommendation 6: Seek a common real-time flight awareness tool for all national operators/programmes, non-governmental operators, and Rescue Coordination Centres (RCCs) use.

There was general support for this recommendation and it was noted there are a range of readily available, low-implementation cost technologies that can assist regionally and cross-Antarctic with flight traffic awareness. Several systems were mentioned and the Dronning Maud Land region has implemented one such system. All operators should collectively explore implementing flight traffic awareness systems, capable of interoperability, and share the data amongst all operators and with RCCs. This will be further discussed by the Air Operations Expert Group.

There was reference to the COMNAP Asset Tracking System (CATS) as developed by the Australian Antarctic Division, which was designed as an information exchange tool, originally for vessel movement. It has evolved to include aircraft but is not fully used and should not be considered a flight awareness or flight deconfliction tool. Through the Air Operations Expert Group, operators should explore alternative, off-the-shelf systems, especially since the technology has evolved significantly since CATS was first developed and make recommendations towards a new off-the-shelf system.

Recommendation 7: Promote increased Notice to Air Missions (NOTAMs) usage.

It was noted that a central location for posting NOTAMs was needed as different countries use different online sites and systems for posting of their NOTAMS. There was also a suggestion as an alternative to NOTAMS being, to implement a “tasking order list” including all assets flying in particular regions and shared amongst that regions’ operators.

It was noted that not all airfields in the Antarctic Treaty area have internet connections, or if they do, they have restrictions related to bandwidth, so access to online sites and systems including for posting of NOTAMs in real-time may not be universally possible.

Recommendation 8: Require direct communications between pilots and alternate destinations.

Recommendation 9: e-AFIM information for new operators - Gateways, regions, dense traffic areas.

There was a comment that this information for new operators might be best presented by simply providing the links to all the relevant national centres, so to ensure currency and accuracy of the information. The example given was for those operating out of Chile to refer to https://servicios.dgac.gob.cl/arsv-web/solicitudes.html#/solicitudArsv.

Recommendation 10: Combine all flight activity information from sources including the Antarctic

Treaty Electronic Information Exchange System (EIES) into an accessible calendar for daily activity and awareness.

There was a suggestion that the aviation-related information in the EIES could be adapted to allow for production of a calendar of seasonal planned air activity. Parties could explore this suggestion with the Antarctic Treaty Secretariat or at a future ATCM. It was noted that this is a possible resource challenge, especially for real-time operations, since the pre-season information as contained in EIES is not updated to reflect any changes due to weather or operations planning needs.

Several 'regions' already produce flight schedule calendars, the DROMLAN schedule was shared as an example. Such tools are challenging to maintain up-to-date and require each organization to take responsibility for ensuring currency/accuracy.

Most national Antarctic programmes with intercontinental flight operations already produce and share such information and flight schedules, although perhaps they need to share that information more widely, that is, beyond the region of operation. For intracontinental activity, any daily changes to the flight schedules are communicated with other operators in the same region.

There was some support for further development of regional calendar systems such as the one currently used in the Dronning Maud Land region. If the ultimate goal is to create a single, unified calendar showing flight operations and flight schedules for the whole of the Antarctic Treaty area, this would be a challenge and should only be explored as a second step in the process after regional systems are developed.

Recommendation 11: Examine the need for standardization of skiway design and engineering.

There was clarification on this that there is not a one-size-fits all for skiway design and engineering and that many skiways are not "engineered" as such-they are unprepared or minimally prepared surfaces. And that while design and engineering and best practice can be shared, skiway design must suit the types of aircraft that will operate/use the particular skiway. Operators should continue to share best practice especially through the Air Operations Expert Group.

Recommendation 12: Consider if a COMNAP standard for aircraft, flight crew, & operations should be adopted.

This recommendation was very general and would require further consideration and more detail before continuing discussion. Many commented that there would be difficulty for COMNAP to do this.

There was caution expressed about this recommendation, as such standards are rightfully controlled by respective national aviation authorities and it is more a matter for ICAO to share best practice between aviation authorities, not the role of COMNAP. It was noted that COMNAP cannot develop standards but can only share information on best practice related to flight crew training, maximum number of hours on duty, etc. Members and all operators are asked to share best practice through the ATCM or the Air Operations Expert Group.

Recommendation 13: Develop an Air Incident Reporting System for all operators.

Sharing of incident reporting and lessons learned is always beneficial and should continue with or without a formal incident reporting system. Although there was some support for an online

database with contributions from aviation providers that could contribute resource, administrative support, on a rotational basis. Some even suggested that the incident reporting system be wider than aviation alone.

It was noted that COMNAP had, in the past, an Accident, Incident & Near-Miss Reporting System for all incidents (broader than air operations alone) and that it was under-utilized and taken out of operation. While a combined Air Incident Reporting System was supported by some, there are questions around resource-maintaining the system, who would populate the system and who would have access to the information. This will be further discussed by the Air Operations Expert Group with input invited from other stakeholders.

The alternative would be to support occasional incident reporting with best practice/lessons learned virtual discussions when incidents or reports from incidents become available. Therefore sharing lessons learned without a formal reporting system as such.

It is useful if any incident reporting included not only the information on the incident itself, but any statistical data on weather conditions, areas where the incident occurred, and SAR response and SAR means used to respond.

Recommendation 14: New members for the COMNAP Air Operations Expert Group.

Recommendation 15: Continued review and update of the minimum survival equipment list(s).

There was agreement to develop and maintain a minimal survival equipment list of items that should be the minimum carried on all personned aircraft in the event of an accident to improve survival. It was recognised that the operator of the particular aircraft should undertake a risk-analysis of the particular flight and circumstances and carry more than the minimum recommended survival gear when necessary. It is also recognised that two lists, one for inter-continental flights and one for intra-continental flights is necessary. It was also noted that consideration of immersion protection be included where appropriate. This might be best achieved by a risk assessment template for factors that could be included in AFIM.

After discussion and considering all comments received to date, there seemed to be agreement to send this advice to the ATCM by way of the COMNAP Working Paper on the continuing review of ATCM Resolution 6 (2021), and for further development within COMNAP of the list (or lists) and templates to be included into AFIM.

Recommendation 16: Tabletop Search and Rescue (SAR) exercises with RCCs.

There was agreement that regular SAR tabletop exercises between all operators and the relevant RCCs remained critically important in support of success in the case of an actual emergency in the Antarctic Treaty area. The triennial SAR Workshops were noted as important to continue this work, many regional networks noted they continue to hold such exercises bilaterally and multilaterally pre-season, and it was also noted that IAATO convenes regular tabletop exercises with the various RCCs and their membership. These are valuable learning tools.

It was noted the next COMNAP SAR Workshop will be held in 2023.

Recommendation 17: Large aircraft SAR and emergency ground support.

There is concern that any emergency that involves a large, passenger aircraft, would be difficult or

impossible to respond to in the Antarctic Treaty area. This applies to overflight tourist and commercial activity that currently takes place. Such scenarios have been discussed as part of the triennial COMNAP SAR Workshops.

For all air operations, there must be risk-analysis and consideration of SAR capabilities. There cannot be a presumption of SAR asset availability and support from other operators in the region.

One program noted they use regulatory oversite in determining minimal requirement and that an upgrade in response is planned for over the course of the next five years.

4.3 In addition to the recommendations, there were also some general observations as noted in the presentations. They are as follows and are listed here in no particular order.

General Observation 1: Application and use of new technology can improve aviation safety. Technology is evolving rapidly and is becoming more readily available and cost-effective. In relation to the benefits of new technologies, we must also consider the area of operation and the real usefulness of the equipment that we are going to install. Most Antarctic flight areas do not have a high density of air traffic, so transponders provide sufficient degree of safety while in areas of relatively high air operations, there must be air traffic services that complement the capabilities provided by the transponder alone for improved situational awareness.

General Observation 2: Aviation activity in the Antarctic Treaty area is likely to continue to increase due to a range of factors including for scientific and touristic activity.

General Observation 3: There are already collaborating aviation regions such as Peninsula, Dronning Maud Land, East Antarctica and the Ross Sea region. These collaborating regions should continue to share best practice in regards to safety.

General Observation 4: Science is often the driver for intra-continental flights, including short-haul flights with helicopters. In addition to safety considerations, it is recognised that environmental principles are fundamental to operations in the Antarctic, including air operations, and that there is need to ensure activity is sustainable.

General Observation 5: There was continuing support for the *COMNAP Antarctic Remotely Piloted Aircraft Systems (RPAS) Operator's Handbook*, with continued regular reviews. There was a recommendation to consider minimum training requirements for Antarctic RPAS pilots and to consider making ADS-B out transponders mandatory for all RPAS deployed in the Antarctic Treaty area. (See also Recommendation 3 above). There was also a suggestion that there could be "no fly zones" or "restricted operating zones" in the case of an RPAS operator without any national certification. This might be difficult to manage and oversee.

General Observation 6: The AFIM (e-AFIM) continues to serve its purpose of information exchange. There was some concern that the file size was too large for limited bandwidth in many parts of Antarctica and options to download only updated components should be explored by the Secretariat. Otherwise, e-AFIM should be made available to all Antarctic air operators as per ATCM Resolution 6 (2021) and all operators must ensure their information is maintained current in the COMNAP Quickbase Database that populates and informs e-AFIM.

General Observation 7: The COMNAP Quickbase Database is a relatively new tool for use by COMNAP Members, Observers, and other stakeholders. It is considered a useful and important

information exchange tool. There were questions raised about limited username and password access that should be further explored by the Secretariat.

General Observation 8: Handheld SATCOM text and position systems, such as inReach, are highly recommended as they provide critical information in emergency and SAR situations. The inReach is also good for passing Terminal Aerodrome Forecasts (TAFs) and Meteorological Aerodrome Reports (METARs).

General Observation 9: There is a need to add training on transport of dangerous goods on aircraft as part of pre-deployment training for all expeditioners, not just those who handle cargo. Many expeditioners, scientists, and tourists may be unaware that some "common" items they pack in their luggage and cargo are considered dangerous goods on an aircraft. This may lead to a dangerous situation inflight. There are also differences here between monitoring and management of dangerous goods inter- and intra-continentally.

5.0 Advice to the ATCM in regards to their review of Resolution 6 (2021)

Based on workshop discussions, COMNAP has prepared a Working Paper "Additional COMNAP advice in regards to ATCM Review of Resolution on Air Safety in Antarctica" which will be submitted to ATCM XLIV (2022) for their consideration. This Working Paper draft will be circulated to the COMNAP MNAPs for their endorsement and approval before submission.

6.0 Summary

The COMNAP Antarctic Aviation Workshop 2022 is part of a series of air operations related seminars, symposiums and workshops that COMNAP has held since early in the days of the Antarctic Treaty. The invitation to participate was open to the community, and there were a range of ways for people to input into the process. The COMNAP Air Operations Expert Group Leader, Paul Sheppard, is thanked for his leadership in the project and workshop. Participants are thanked for their involvement and their willingness to share expertise to improve understanding of the practical and technical issues in support of our safety goal.

COMNAP will consider the outcomes of the workshop during the Air Operations Expert Group session at AGM 2022, will share the Report with all stakeholders and will provide advice based on the workshop discussions to the ATCM. The ATCM will be asked to consider the advice provided to improve air safety in Antarctica.

Appendix 1: Registration List

COMNAP Antarctic Aviation Workshop 2022 - ALL Registrants			
		With those highlighted in grey participating in the plenary session UTC 15 March 2022	
First Name	**Last Name**	**Organisation**	**Country**
Michelle	Finnemore	COMNAP Executive Secretary	
Andrea	Colombo	COMNAP Secretariat, Engagement, Information and Project Manager	
Pablo Alejandro	Andino	Fuerza Aérea Argentina, Piloto de C-130, Jefe de División en el Departamento Operaciones en Desarrollo del Comando de Adiestramiento y Alistamiento	Argentina
Jorge	Bena	Fuerza Aérea Argentina, Squadron Leader	Argentina
Ramiro	Bialet Peralta	Argentinian Air Force, UAV Pilot	Argentina
Sergio	Bruno	Comando Conjunto Antártico - Argentina, Jefe Componente Aéreo	Argentina
Ignacio	Felici	Fuerza Aérea Argentina	Argentina
Patricia	Ortuzar	Direccion Nacional del Antartico, Director/ Manager	Argentina
Sebastian	Sandali	Air Force, Squad leader (MI 17 helicopter)	Argentina
Charlton	Clark	Australian Antarctic Divsion, General Manager Operations & Safety	Australia
Scott	Constable	Australian Maritime Safety Authority, Principal Advisor Aviation Policy.	Australia
Aaron	Read	AAD, Aviation Manager	Australia
Brad	Sinclair	Civil Aviation Safety Authority, Aerodrome Inspector	Australia
Don	Hudspeth	Australian Antarctic Division, Operations planning	Australia
Roberto	Gomes	Brazilian Air Force, Crew member	Brazil
Haynnee	Souza	Brazilian Antarctic Program PROANTAR, International Relations Division	Brazil
Sebastian	Berrios	FACH, Pilot	Chile
Rafael	Castillo	Chilean Antartic Programm, Antartic Adviser Defense Ministry	Chile
Lars	Christiansen	Armada de Chile, Antarctic operation and logistic coordination	Chile
Miguel	Figueroa	Programa Antártico Chileno FACH, Jefe antártico Fuerza Aérea de Chile	Chile
Fernando	Machuca	FACH, Logistic	Chile
Hector	Pinto	FACH, Helicopter Pilot	Chile
Xuyu	Cheng	Polar Research Institute of China, Engineer	China
Wei	Long	Chinese Arctic and Antarctic Administration, Head of the International Cooperation Division	China
Xiaosong	Shi	Polar Research Institute of China, Engineer	China
Fuhai	Wei	Polar Research Institute of China, Head of Polar Development and International cooperation Division	China
Zilong	Weng	Chinese Arctic and Antarctic Administration, International cooperation division stuff	China
Tijun	Zhang	Polar Research Institute of China, Deputy Director of PRIC	China
Ingrid	Bejarano	Colombian Air Force, Investigation Specialist	Colombia
Santiago	Bolañoz Barrera	Colombian Antarctic Program , International and Antarctic Affairs Advisor	Colombia
Cristhian	Campos	Colombian Air Force, Operational Investigation Specialist	Colombia
Diego	Cortés	Colombian Air Force, CIBAE Center Boss	Colombia
Gerson Ricardo	Jaimes Parada	Colombian Air Force, Science, Technology and Innovation Manager	Colombia
Natalia	Jaramillo	Programa Antártico Colombiano, Antarctic and Scientific Affairs Advisor	Colombia
Danna	Rodríguez	Programa Antártico Colombiano, Jefe Asuntos Internacionales y Políticos	Colombia
William	Tabares	Colombian Air Force, Pilot	Colombia
Pavel	Kapler	Czech Antarctic Research Programme, Manager	Czech Republic
Juan Diego	Betancourt	Armada del Ecuador, Lieutenant Commander (Navy Aviator)	Ecuador
Wilson	Bohorquez	Navy, Chief of Air Operations	Ecuador
Michael	Lainez	Armada del Ecuador, Supervisor Electrónico	Ecuador
Christian	Moran	Armada del Ecuador, Aviador Naval	Ecuador
Roberto	Ontaneda	Armada del Ecuador, Aviación Naval	Ecuador
Juan	Saltos	Armada del Ecuador, Piloto de helicópteros de la Aviación Naval	Ecuador
Tim	Heitland	Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research, Medical Coordinator	Germany
Uwe	Nixdorf	Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research, Deputy Director, Head of Operations and Research Platforms	Germany
Daniel	Steinhage	Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research, Coordinator Polar Aircraft	Germany
Christine	Wesche	Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research, Logistics coordinator for Antarctic land campaigns	Germany
Rocco	Ascione	PNRA/ENEA, logistic manager	Italy
Gianluca	Bianchi Fasani	Italian Antarctic Program - ENEA, Logistic manager	Italy
Marco	Santulli	Italian Air Force, Pilot	Italy
Nicky	Burgess	Antarctica New Zealand, Programme Planner	New Zealand
Nikki	Gardner	Antarctica New Zealand, Senior National Officer	New Zealand
Simone	Hartmann	Antarctica New Zealand, Antarctic Project Planner	New Zealand
Greg	Johnston	Rescue Coordination Centre New Zealand (RCCNZ), Senior Search and Recue Officer / Acting Watch Leader	New Zealand
Johno	Leitch	Antarctica New Zealand, Operations Solutions Manager	New Zealand
Peter	McCarthy	Antarctica New Zealand , Programme Planner	New Zealand
Patrick	Power	Antarctica New Zealand, Planning and Delivery Manager	New Zealand
Simon	Trotter	Antarctica New Zealand, General Manager Antarctic Operations	New Zealand
Chris	Wilson	RCCNZ, Senor Search and Rescue Officer	New Zealand
Paul	Woodgate	Antarctica New Zealand, Logistics Manager	New Zealand
John	Guldahl	Norwegian Polar Institute, DMNAP	Norway
Sven	Lidstrom	Norwegian Polar Institute, Operations and Aviation	Norway
Birgit	Njåstad	Norwegian Polar Institute, Program leader	Norway
Cesar	Cueva	Fuerza Aérea del Peru, Director de meteorología aeronáutica	Peru
Aliaksei	Haidashou	Republic Centre for polar research NAS Belarus, Deputy chief of the centre, Head of the Belarusian Antarctic Expedition	Republic of Belarus
Igor	Pilshchikov	The Republican Centre for Polar Research, Deputy Head for General Issues and Logistics	Republic of Belarus
Seonung	Choi	Korea Polar Research Institute, Logistic Operator	Republic of Korea
Sunhwei	Kim	KOPRI	Republic of Korea
Sebin	Lee	KOPRI, Administrative Associate	Republic of Korea
Oleg	Kotrubenko	RAE, Chief Specialist (logistics and aviation manager)	Russian Federation
Victor	Pomelov	AARI, Environmental manager	Russian Federation
Jared	Blows	MRCC Cape Town , MRCC Chief	South Africa
Nishendra	Devanunthan	SANAP - Department of Forestry, Fisheries and Environment, Director	South Africa

Sonia	Ramos	Spanish Polar Committee, Deputy Technical Secretary	Spain
Magnus	Augner	Swedish Polar Research Secretariat, Head of Department, DMNAP	Sweden
Doğaç Baybars	Işıler	Polar Research Istitute, TUBITAK MAM, Polar Expedition Logistic and Law	Turkey
Rod	Arnold	British Antarctic Survey, Head of Air Unit	United Kingdom
William	Gregory	NSF/U.S. Antarctic Program, Transportation Program Manager	United States of America
Gary	James	NSF/OPP/AIL, USAP Aviation Program Manager	United States of America
Margaret	Knuth	NSF/USAP, Chief Program Manager	United States of America
Paul	Sheppard	NSF/OPP, Executive Office	United States of America
Julio	Bardesio	Uruguayan Air Force , Flight Safety Director	Uruguay
Mario	Cetraro	IAU, Planning and Operations of Antarctic Campaign	Uruguay
Brian	Crocker	IAATO - Kenn Borek Air, President	IAATO
Rodrigo	Gomez	IAATO - DAP, Operator	IAATO
Lisa	Kelley	IAATO, Director of Operations	IAATO
Anne	Kershaw	The Polar Commitment Foundation, Executive Director	IAATO
Stuart	McFadzen	IAATO - White Desert, Operations	IAATO
Andrea	Pivcevic	IAATO - DAP, Operator	IAATO
David	Rootes	Antarctic Logistics & Expeditions (ALE)/IAATO, Environment and Logistics	IAATO
Richard	Skinner	IAATO - TAC, Operator	IAATO
Patrick	Woodhead	IAATO - White Desert, Operator	IAATO
Deneb	Karentz	SCAR Vice President	SCAR
Yeadong	Kim	SCAR President	SCAR
Mark	van den Berg	BigLift Shipping, Business Development Manager / Commercial Manager niche markets	Netherlands

Appendix 2: Brief summary of presentations

THEME: COMMUNICATIONS

"COMNAP Products: data collection, management, revisions and distribution"

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This presentation looks at the current range of COMNAP products and information tools that support open and up-to-date information exchange for use by our Membership and other stakeholders, including the Antarctic Treaty Secretariat. The focus is on the Quickbase database, the Antarctic Telecommunications Operators Manual (ATOM), and the Antarctic Flight Information Manual (AFIM).

The Quickbase database contains all the information that informs the range of COMNAP products. It is important that national Antarctic program's database points of contact and AFIM points of contact regularly review all their information in the database and update as needed. Both ATOM and AFIM are products produced by COMNAP at the request of the ATCM. For ATOM see ATCM Resolution 2 (2015); for AFIM see ATCM Resolution 6 (2021). ATOM is automatically updated when a data field is updated in the Quickbase database. ATOM is readily available via the Quickbase app that you can download to your mobile phone.

All air operators, governmental and non-governmental alike, are asked to contribute their information to AFIM via the COMNAP Data Dashboard for regular releases to AFIM subscribers, governmental and non-governmental, throughout the Antarctic summer season.

The COMNAP Asset Tracking System (CATS) is an additional exchange of information tool developed and administered by the Australian Antarctic Division for COMNAP. CATS displays near-real time locations for reporting vessels, fixed-wing & rotary-wing aircraft. The CATS successfully displayed position information on three research balloons this season and can be extended to Remotely Piloted Aircraft Systems (RPAS). The use of this voluntary CATS is supported by the ATCM Resolution 6 (2010) which encourages participation in vessel tracking schemes or regularly reporting of positions to the relevant regional rescue coordination centre.

Feedback is invited on ways to improve the database, the COMNAP products and our information exchange with other stakeholders, including with the Antarctic Treaty Secretariat.

THEME: COMMUNICATIONS

"Recommendation for COMNAP Best Practice Addition to AFIM on Position Reporting"

Gary James
Aviation Program Manager, Office of Polar Programs US National Science Foundation
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This presentation proposes a change to AFIM Appendix 2 to include additional paragraphs related to use of standard aviation departure reports and standard position reports for aircraft enroute. The use of such reporting forms and procedures would address challenges related to language barriers and to improve communications related to air operations in the Antarctic Treaty area.

There is a request for COMNAP to consider adding “Standard Departure and Position Reporting” to the AFIM Appendix 2 “Prior Approval, Advance Notification, and Use of Antarctic Flight Plan”. Suggestions for new paragraphs 5 and 6 are made in the presentation. Paragraph 5 would describe the Standard Departure Report. Paragraph 6 would describe the ICAO Standard Position Report. The inclusion of these two new paragraphs will assist to standardize reporting as best practice for air communications on continent in order to further enhance aviation safety.

THEME: SAFETY

THEME: TECHNOLOGY

“Transponder Landing System (TLS) Update”

Gary James
Aviation Program Manager, Office of Polar Programs US National Science Foundation
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This presentation provides information on McMurdo Station’s two airfields: Phoenix (NZFX) a compacted snow runway for wheeled aircraft; and Williams Field (NZWD) for ski aircraft only. There was Precision Approach Radar (PAR) up to 2000. From 2000 to 2022, USAP used Microwave Landing System (MLS). The MLS will be decommissioned at the end of the 2021/22 Antarctic summer season (March 2022).

A range of new technology was considered as the MLS replacement. From 2022 forward, the TLS will be implemented at both McMurdo airfields. There are many advantages to TLS including that any aircraft with instrument Landing System (ILS) capability and a transponder can use this approach.

TLS provides multi-functional aid to navigation that complies with ICAO SARPs. The presentation shows graphics to explain how a TLS broadcasts ILS signals, and also shows graphics on the technical operational sequence. Minimal pilot training is needed and no new avionics equipment is required. When operating the TLS simultaneously provides area surveillance to 60 nautical miles. There is a limitation that only one aircraft can be on final approach at a time.

THEME: SAFETY

THEME: TECHNOLOGY

“Remotely Piloted Aircraft Systems (RPAS) Transponder Recommendation”

Gary James
Aviation Program Manager, Office of Polar Programs US National Science Foundation
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RPAS use in the Antarctic is growing and is expanding in to airspace used for personned aircraft operations. RPAS are difficult to see and there is a risk that pilots will not be able to “see and avoid” RPAS by purely visual methods. This presentation proposes all RPAS being operated in the Antarctic Treaty area contain a working micro-transponder in order to broadcast the RPAS information during flights in order to assist with deconfliction of active airspace.

Some national legislation currently prohibits use of ADS-B out transponders on RPAS in their

domestic airspace. This prohibition is principally due to high numbers of RPAS in use in some areas. This would not be a problem in the Antarctic Treaty area where, relatively speaking, RPAS use is still extremely low and is focused on the austral summer months of the year.

The presentation presents graphic on how ADS-B out works. Examples of available RPAS transponder technology currently available. The range of technology allows for the RPAS pilot to move away from any other aircraft in the vicinity or to land the RPAS for safety reasons.

There is a request to COMNAP to recommend that ADS-B micro-transponder be used on all RPAS taken to the Antarctic Treaty area to the maximum extent possible and as technology becomes available and that the next review of the *COMNAP RPAS Operator's Handbook* consider inclusion of this best practice into the handbook.

THEME: SAFETY

THEME: TECHNOLOGY

"Traffic Collision Avoidance System (TCAS)"

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This presentation explores the best technologies to assist with deconfliction of active airspace, with flight-tracking and flight-following in real-time. TCAS is already required by the ICAO to be used in aircraft with more than 19 passengers or greater than 5700kgs. The presentation includes graphics on how TCAS works to deconflict airspace-there are simple and complex systems with costs commensurate with increasing complexity.

One key TCAS assumption is that all aircraft will have their transponders turned on. TCAS relies on receiving transponder signals from other aircraft. There is currently no requirement for transponders to be turned on in aircraft while flying at low altitude in the Antarctic Treaty area. In many situations, TCAS technology is installed in the aircraft, however, the systems are ineffective if all pilots do not turn their transponder system on. The presentation requests COMNAP to consider that all aircraft, balloons, and RPAS have transponders and/or ADS-B Out beacons turned on during flights in the Antarctic Treaty area. Most TCAS systems if turned on would give an audible warning to the pilot if other aircraft are operating in the same vicinity so the pilot can make decisions to avoid an incident.

It is also recommended that we consider that all aircraft have either TCAS or ADS-B In capabilities.

THEME: SAFETY

THEME: TECHNOLOGY

"The 'Ins & Outs' of ADS-B: An introduction and its role in future Antarctic aviation programs"

Brian Crocker[1] & Michael Whitley[2]
1 President, Kenn Borek Air bcrocker@borekair.com
2 Lead Pilot, Kenn Borek Air mwhitley@borekair.com

The presentation discusses how ADS-B works. Key features are:

- ADS-B equipped aircraft automatically report their position without the need for radar. TCAS can then be incorporated for Traffic Advisory and Resolution Advisory.
- ADS-B is dependent on an aircraft having an approved WAAS GPS and transponder.
- ADS-B allows for real-time monitoring.

All KBA aircraft have operational transponders installed. With ADS-B Out, the aircrafts position, altitude and speed is broadcast once per second to nearby aircraft, ground stations and Iridium satellites. While ADS-B In allows aircraft to receive ADS-B Out transmissions. Ground station technologies now allow for privately operated, small, portable devices that are much less expensive than radar systems. Range is dependent on line-of-sight and antenna height/signal strength.

The use of such technology will enhance situational awareness. The presentation explores whether ADS-B is necessary if aircraft already has TCAS and explains that ADS-B is not intended as a replacement to TCAS but to enhance it. AS TCAS relies on interrogation and reply, it takes time. When coupled with ADS-B aircraft position is broadcast automatically at much shorted intervals and uses WAAS GPS which is more accurate.

ADS-B is not currently mandated for use in the Antarctic Treaty area. Marsh Airfield is the only ground-based ADS-B station in Antarctica. The presentation therefore explore the possibility of utilising “space-based” ADS-B and notes that the Aireon constellation of 66 Iridium satellites were activated to air traffic control with Pole to Pole coverage. This will increase situation awareness and would work with other technologies such as FlightAware©.

The presentation recommends that all aircraft being operated in the Antarctic Treaty area have ADS-B In and ADS-B Out avionics installed for both inter- and intra-continental operations.

THEME: OTHER Update

“Boulder Clay Runway Update”

Gianluca Bianchi-Fasani
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This presentation provides an update on the construction of the Boulder Clay gravel runway near the seasonal Mario Zucchelli Station (Terra Nova Bay). The construction began in 2017. Construction is by placing rock-fill over ice creating a stable pavement. A paper on the investigation of the site before construction began is available online (doi:10.3390/rs11121501).

Construction was delayed during the 2020/21 Antarctic season but continued during the 2021/22 season. Currently the length of the runway is 1700 metres and is 60 metres in width (70 metres including the back track area). The 140 metre wide apron has also been constructed. Continuing construction in the 2022/23 season will include completion of the top layer of the apron and hanger’s basement. Consultation with the Italian Air Force is in progress as to when the runway will be used for landing of its aircraft.

THEME: SAFETY

"Dronning Maud Land Air Network (DROMLAN)"

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DROMLAN is a non-profit, international cooperative project formed by twelve national Antarctic programs to provide a more economic, flexible and timely entry to Antarctica to/from Dronning Maud Land (DML) from South Africa. DROMLAN implements a range of safety arrangements:

- Communications list-updated before each season with contact details and overview of length of season from each participating national Antarctic program.
- ADS-B receivers in DML at Princess Elisabeth Station, Novo Runway, Troll Station, SANAE IV and Neumayer III Station-provide a clear picture of aircraft flight situation during the season.
- Flight notifications: pre-flight notifications, flight departure and flight arrival notifications.
- Flight weather service is established at Neumayer II Station in cooperation between AWI and the German Weather Service and provides forecasting, daily weather charts and daily colour forecast chart providing an easy to read chart of landing conditions at all stations and depots in the DML region.
- Search and Rescue (SAR) co-operative arrangements are in place with aircraft on stand-by in Cape Town during the season (end of October until end of February) and aircraft available for transport between a station and Novo runway.
- An ALCI Communication Centre at Novo Airbase is personned 24-hours a day during the season.

Further information on the DROMLAN can be found in ATCM XL (2017) Information Paper 42.

THEME: OTHER Supporting Science

"Sustainability Principles in Antarctic Aviation"

Yeadong Kim[1] & Deneb Karentz[2]
1 President, Scientific Committee on Antarctic Research (SCAR)/Korean Polar Research Institute (KOPRI)
2 Vice President for Science, SCAR/Professor and Chair of the Biology Department at the University of San Francisco, USA
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This presentation discusses the importance of aviation in facilitation of Antarctic research and provides a perspective to ensure sustainability of the activity. There are international agreements supporting reduction of greenhouse gas emissions. Recently, the ATCM XLIII agreed Resolution 8 (2021) "Antarctica in a Changing Climate" which recommended that Governments "support their National Antarctic Programmes and SCAR in their ongoing efforts to undertake research about climate change and its impacts..." Calls for increased research activity, may be at odds with reduction of emissions related to such activity. SCAR is a thematic organisation of the International Science Council which has endorsed sustainability principles.

With aviation demand increasing in the Antarctic Treaty area, there are growing environmental

concerns about rising carbon emissions related to that activity. Balancing sustainability issues with need for scientific observations and results from Antarctica requires careful and focused consideration. The presentation refers to the information in the COMANP Antarctic Roadmap Challenges (ARC) project which contains relevant messages to assist in the balancing discussion. International collaboration is the most important value in Antarctic science and allows for sharing and more efficient use of facilities, greater community access to critical technologies and collective ability to deploy research teams to rapidly changing Antarctic areas. This international collaboration applies to collaboration in air operations. There are several examples of well-coordinated and successful regional best practice examples. There may be opportunities to build, or expand, upon such collaborations. There should also be priority to ensure that fuel efficient aircraft are used whenever possible and that technological innovations continue to be considered and applied. COMNAP and SCAR will together continue to work on these issues.

THEME: OTHER Update

"An Overview of IAATO Air Activities"

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This presentation gives a brief history of IAATO and its goals in support of safe and environmentally responsible Antarctic private-sector travel. There are 42 operators, 14 provisional operators, and 47 associates within IAATO, with work being done within the organisation by 11 committees, eight working groups and seven Secretariat staff. All IAATO Member's activity is permitted through the relevant Antarctic Treaty competent authority.

In regards to IAATO air operations there are currently three deep field air operators, one air-only operator for air-cruise, and six vessel helicopter operators. In addition, RPAS operations take place. The deep field operators operate aircraft and ground facilities that support inter-continental and intra-continental flights in support of a wide range of activities, including support to national Antarctic programs. These operators also share and coordinate SAR activity and resource. Deep field visitors make up only 1% of all IAATO visitors to Antarctica. IAATO has a Deep Field / Air Operators Committee.

Vessel helicopter operations have expanded in the last five years, with operations moving to the larger CAT 1 and CAT 2 vessels, and expanding to scenic flights (oversite), skiing and trekking. There are six operators that run helicopter flight operations. It is expected that superyachts will continue to use helicopters and a small increase in CAT 1 and CAT 2 use of helicopter as part of their programme of activities is anticipated for future seasons.

In 2017, IAATO created their Helicopter Working Group to enhance and develop guidelines for related activities. IAATO air-cruise operations is currently limited to one operator, who runs operations between Punta Arenas, Chile, and King George Island, where passengers board their vessels. That operator also provides emergency medical evacuation service from King George Island when needed. There are limitations to the Air-Cruise industry.

IAATO operators utilise RPAS to support commercial activities and for voyage navigation. All such activity must be permitted through a competent authority. Any researchers' on-board IAATO vessels may also deploy RPAS, but most do so under their own permits from the relevant competent

authority. IAATO banned RPAS for recreational use in Antarctic coastal areas and follows guidelines based on best practice and as endorsed through the Antarctic Treaty System.

THEME: SAFETY

"Safe Transport of Dangerous Goods by Air"

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This presentation considers outcomes and shares lessons learned from an incident classified as "Dangerous Goods Incident" in accordance with ICAO Doc. 9284 "Safe Transport of Dangerous Goods by Air". The aircraft was landed safely and no personnel were injured and there was no damage to the aircraft.

Issues identified:

1. There was a communication barrier. Meaning that, the package with the dangerous goods was delivered to a Spanish-speaking crew by a non-Spanish speaker, so that there was not clear communications of the contents of the package.
2. The particular aircraft was being uploaded with cargo in an urgent/quick manner; there was a focus on getting things loaded quickly.
3. The safety data sheet that accompanied the package with the dangerous goods was improperly filled out and it was not adequately reviewed.

Lessons learned/shared:

A. Dangerous goods education should be part of every national Antarctic programs' pre-deployment training programmes, going beyond air crew/flight crew to extend to logisticians, expeditioners/passengers, the researcher/scientists & the medical community.
B. Items considered "dangerous goods" under the ICAO framework are in everyday use, however, people may not think about those items being dangerous on aircraft. Such goods include batteries and dry ice as only two examples.
C. ICAO Annex 18 posters can assist with training/education.
D. The goal should be to increase awareness in your programme. Then identify, classify, package properly and label property before deciding to load onto aircraft.
E. A dangerous goods response kit should be carried on-board aircraft and crew should be well-trained to quickly locate and use.
F. Any incidents should be reported and lessons learned shared.

THEME: SAFETY
THEME: TECHNOLOGY

"Using ADS-B Technology for Flight Tracking and Coordination in Dronning Maud Land"

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This presentation provides information on flight tracking and coordination in the DML area of Antarctica and encourages use of the system in all regions. DML provides a good example since there are now facilities and airfields run by both governmental and non-governmental operators alike with an increase in both inter- and intra-continental flights. At the same time, technology is evolving and so, ADS-B receiving technology is used throughout the region (since 2015). Equipment for use in Antarctica can be provided for free as long as the flight data is shared/made freely available in return.

ADS-B works when an aircraft determines its position via GPS satellites and then periodically broadcasts the positions which enables it to be tracked if you have equipment to receive the broadcasts (other aircraft or ground stations) or use one of the online services that collects ADS-B data and present it on a website. The DML region uses Flightradar24.com and has five installations of ADS-B across the region covering all stations in the region. Several examples of working displays are provided in the presentation. In addition to real-time position information, there is also a "playback" function to look back at past activity.

There is currently a limitation to the system in that flight tracking only works when there is coverage by ADS-B ground receivers, however, satellite ADS-B tracking is possible and under development. It is a compliment to the other technologies available. Transmitters can also be placed on RPAS and balloons.

THEME: OTHER Update

"Ground Support Assets for Chinese Antarctic Aviation Operation along the way from Zhongshan Station to Further Inland"

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This presentation begins with the basic operation of the Snow Eagle 601 ski-equipped aircraft and its areas of operation during a usual season (late October through late February). The aircraft operations support international cooperation, aerial surveys, personnel transit and inland traverse operations. The operation of the aircraft is supported by facilities in a field camp near Progress Skiway, about 10kms away from Zhongshan Station. There are other land transport and rotary-wing assets available to transit personnel to the field. Aviation fuel is also available and environmental principles are fundamental to the operations there.

Automatic weather system (AWS) installation supports air operations with weather forecasting. This supports the operation to traverse from Zhongshan Station to Kunlun. Taishan Camp skiway also supports this operation. There is a new hut and skiway established in support of this air transit and land traverse inland. Kunlun Station on the high plateau, is 1200kms away from Zhongshan Station and the air operations and facilities support safe operations while transiting between the two facilities.

THEME: SAFETY

"Survival Equipment on Aircraft"

Rod Arnold
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This presentation reviews the work of the Antarctic Aviation Working Project Working Group for Output 3: Develop mínimum survival equipment recommendations for carriage on aircraft. It is noted that each operator should carry out a risk-based analysis before each operation to understand and address risk related to each specific flight and specific activity.

Output 3 Working Group's approach was to divide the equipment into the following categories: Food & cooking, personal equipment, group equipment, communications and shelter. Specific hazards and risks were necessary to consider, including type of flight (crew only, inter- or intra-continental, ship-based helicopter operations were noted as a few examples). It was also important to consider aircraft type.

Runway type(s) consideration was also considered as important, as is region of operation and likely response times. Deep field deployments have a greater response time as compared with coastal operations.

Coordination between operators and advanced training is vital in survival situations. For example, it is no use carrying equipment for survival if people are not trained in the proper use of that equipment. Teaching basic survival skills to all deployed personnel can make the difference in an emergency or accident situation.

The recommendation is for the outcomes of this discussion be included in AFIM.

Appendix 3: Core Set of Questions

Question set A: Current Regulatory Framework

Background to this set of questions: The focus in this set is on the current Antarctic Treaty System regulatory framework. Your responses will contribute to the COMNAP advice to the Antarctic Treaty Consultative Meeting (ATCM) in regards to recommended updates to the current ATCM regulations in the context of air safety in Antarctica. This specifically will inform any COMNAP advice to the ATCM on ATCM Resolution 6 (2021) Air Safety in Antarctica (paragraphs 4, 5, and 8) and may also inform more general COMNAP advice to the ATCM in regards to air safety.

Question A.1: Is the current regulatory framework robust enough to respond to identified safety challenges?

Question A.2: Are there gaps in the regulatory framework, and if yes, what are those and how can those gaps be addressed?

Question A.3: What did the regulatory framework cover adequately that now, given recent changes in operations, the coverage may be inadequate? What are these areas for improvement?

Question set B: Safety

Background to this set of questions: While every aspect of air operations include a safety component, there are specific, focused elements to the safety discussion that should be considered. Aspects of this will assist COMNAP to provide improved tools and products (see also question set C) to assist programmes to meet their safety goals, while other aspects are targeted at improving safety during real-time air activity, including minimum equipment carriage, communications and deconfliction of airspace.

Question B.1: Should we as a community (non-governmental and governmental alike) establish and contribute to a combined Antarctic air incident reporting system? If yes, what would it looks like? Who would maintain it? What would be useful to report?

Question B.2: See proposed list(s) for minimal survival equipment on aircraft operating intra- and inter- the Antarctic Treaty area. Any additions? Comments?

Question B.3: We have the "COMNAP Remotely Piloted Aircraft Systems (RPAS) Operators Handbook" (version 6, 15 September 2021) as guidance for RPAS operation in Antarctica. IAATO Members also follow IAATO recommendations. Is our current guidance adequate? Do we need more guidance? Should we consider requirements to establish RPAS no fly-zones or no-fly-times? What about minimum training standards for RPAS pilots?

Question B.4: Consider and agree a policy position in regards to whether all air activity (RPAS, research balloons, etc.) should be equipped with transponders/ADS-B for complete air situational awareness. What is your view on recommending such a requirement?

Question B.5: Are designated Primary Air Information Stations (PAIS) and Secondary Air Information Stations (PAIS) still relevant? Is the TIBA procedure still relevant? If they are not, what is the recommended/preferred alternative?

Question set C: Communications

Background to this set of questions: This is primary about how we can improve COMNAP products and information tools such as the Antarctic Flight Information Manual (AFIM, also now known as e-AFIM) and the Antarctic Telecommunications Operators Manual (ATOM). There may be other information exchange systems, products and tools that could be improved.

Question C.1: Is the e-AFIM is achieving its purpose? Is in the hands of those who need it/use it? How can we improve it?

Question C.2: What are the barriers for all Antarctic air operators to keep current and accurate their data/information that informs e-AFIM? How can we reduce those barriers? Is the data dashboard still effective?

Question C.3: Any suggestions on how we can continually improve information exchange and timely communications between COMNAP Member National Antarctic Programs, Governmental Air Operators and Non-governmental Air Operators in Antarctica? (This is not about retime communications during flights).

Question C.4: Do you use the COMNAP Quickbase database? Have you seen the ATOM lately? Can we do anything to improve your access to COMNAP data/information?

Question C.5: Any suggestions we can recommend to the ATCM in regards to the Electronic Information Exchange System (EIES) to enhancement that system in relation to air operations and advance information exchange?

Question set D: Technology

Background to this set of questions: What technologies work best under Antarctic conditions, with limited bandwidth capabilities and with remote areas and across large distances? How can we keep costs down while continuing to provide critical technology and systems?

Question D.1: What are the best technologies to assist us with deconfliction of active airspace in the Antarctic Treaty area? What does your programme use?

Question D.2: Any recommendations on appropriate technologies and sharing arrangements in regards to flight tracking / flight following?

Question D.3: In regards to Search and Rescue (SAR) events, is there any innovative technologies that could improve our coordinated ability to respond? Can we share those? What are the obstacles to sharing any innovative technologies and information?

Question D.4: Propose suggestions for mandatory inclusion and use of technology for real-time surveillance and tracking.

Question D.5: Explore usefulness of currently available tools, such as the COMNAP Asset Tracking System (CATS) and any off-the-shelf applications, for situational awareness of Antarctic aviation (and of vessels? And of land-based vehicles?). Any suggestions?

Any other comments, questions, concerns or considerations you would like the COMNAP Aviation Project Steering Committee