



COMNAP

Council of Managers
of National Antarctic Programs

FINAL REPORT
Antarctic Search and Rescue (SAR) Workshop IV
Improving SAR Coordination and Response in the Antarctic

Convened by the Council of Managers of National Antarctic Programs (COMNAP)

Co-hosted by the Joint Rescue Coordination Centre New Zealand (JRCCNZ) Maritime New Zealand
& Antarctica New Zealand



**Antarctica
New Zealand**

14 May (Tuesday) and 15–16 May (Thursday and Friday) 2019
Wellington and Christchurch, New Zealand

Antarctic Search and Rescue (SAR) Workshop IV Improving SAR Coordination and Response in the Antarctic

FINAL REPORT

31 May 2019

Background

In 2013, the Antarctic Treaty Consultative Meeting (ATCM) formally recognised the Council of Managers of National Antarctic Programs (COMNAP) efforts “...to continue to foster collaborative discussions and vital sharing of information regarding SAR matters including through: holding triennial workshops on search and rescue...” (ATCM XXXVI Resolution 4 (2013)). COMNAP convened the first Antarctic SAR Workshop in Valparaiso / Viña del Mar, Chile, in August 2008. Two further workshops followed; SAR Workshop II (Buenos Aires, Argentina), 2009; and SAR Workshop III (Viña del Mar, Chile), 2016.

As per Resolution 4 (2013), the COMNAP Antarctic SAR Workshop IV was open to representatives from all of the relevant Rescue Coordination Centres (RCCs), from National Antarctic Programs, relevant experts including from the International Association of Antarctica Tour Operators (IAATO), Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) and the International Maritime Organization (IMO), as well as commercial operators and service providers. The workshop was of a technical, practical and non-political nature held in the spirit of the Antarctic Treaty 1959.

Introduction

COMNAP considers safety of human life of primary concern in all Antarctic activities. In support of the goal to improve SAR coordination and response in the Antarctic Treaty area, COMNAP convened Antarctic SAR Workshop IV.

The workshop was held in partnership with co-hosts the Joint Rescue Coordination Centre New Zealand (JRCCNZ) Maritime New Zealand and Antarctica New Zealand. The workshop schedule was developed across four days and two cities in order to highlight the work and offices of the New Zealand SAR agency in the capitol city of Wellington, and the work and offices of the New Zealand National Antarctic Program located in the city of Christchurch, New Zealand.

Workshop IV began with a JRCCNZ-focussed discussion in the city of Wellington on Tuesday 14 May 2019 and continued in the city of Christchurch on Thursday 15 May and Friday 16 May to address the objectives and agenda of the workshop.

Fifty-five people attended the Wellington day of the workshop and fifty-eight people attended the Christchurch workshop days (see Appendix 1 for lists of delegates).

This is the report of key outcomes from the agenda item sessions of the workshop. The agenda and schedule are Appendix 2 and the list of action items is Appendix 3 of this report.

Workshop Objectives

The overarching objective of the workshop was to continue **to improve Search and Rescue (SAR) coordination and response in the Antarctic** as a follow up on SAR Workshops I (2008), II (2009) and III (2016).

Specific objectives of this fourth workshop were to:

- Conduct a review of progress, in particular on actions arising from the previous workshops;
- Continue the exchange of timely and useful information that can be used in the event of a SAR situation;
- Present examples of best practice to support SAR coordination and response;
- Exchange information on aviation safety including advanced notification of air operations in support of prevention of incidents, accidents and near-misses;
- Discuss lessons learned from recent real Antarctic emergency incidents;
- Engage all participants in regional coordination and response to Mass Rescue Operations (MRO) scenarios.

Disclaimer

Nothing mentioned in this document should be considered contrary to any of the international conventions in force regarding SAR and related issues, which are regulated by IMO, ICAO, and by national laws and regulations in force. The use and designation of any name or area, including any geographic place name and statements made in regard to dates in any presentation, do not imply any opinion whatsoever on the part of COMNAP concerning the legal status of any country, territory or authority in the context of the Antarctic Treaty.

Workshop Discussion and Outcomes

The workshop participants agreed that the Final Report would reflect the key messages from the workshop and would not be a fully minuted report. The key messages are presented in groupings that align with the workshop sessions, that is, by relevant agenda item. The key messages are numbered for convenience of reference, not in order of importance.

Agenda Item 3

Key messages from Rescue Coordination Centres (RCCs)

General

1. Each of the five RCCs which have responsibility for coordination and response over a portion of the Antarctic Treaty area, also have responsibility over extremely large areas, including large marine areas and areas to the north of the Antarctic Treaty area. In all cases, the Antarctic Treaty region is a small proportion of a country's total SAR area of responsibility.
2. There are increases in activity related to science, tourism, fisheries and commercial aviation with routing that crosses below 60° South. More people in the Antarctic Treaty area, regardless of purpose of their activity, mean more probability of accident, incident or requirement for emergency response.
3. For the Peninsula region, assets that could be used for SAR response are dedicated. For the other SAR regions, there are often no dedicated SAR assets. In most cases, even any dedicated asset is not normally located in the Antarctic Treaty area; it is generally external to the area and must be deployed across long distances before it can be in a position to assist. In addition, the availability of assets varies throughout the year. For example, there are limited air/aviation capabilities available in the Antarctic Treaty area in the austral winter months.
4. In addition to assets that could be deployed, SAR agencies and gateway countries support a range of other services, such as Search and Rescue Satellite Aided Tracking (SARSAT) coverage. Both assets and services can be called upon to assist in an Antarctic SAR event.
5. In the event medical attention is required, "assets" must include medical personnel and so involve a human resource. Therefore, availability of a "thing" on its own is not always sufficient; availability of people with the appropriate skills is often required but may not be readily available in the Antarctic Treaty area. In addition, available medical personnel may not always be equipped to deal with mass casualty situations.
6. The closest vessel or other asset may not be the most suitable to the conditions of the rescue response.
7. For some RCCs, assets to support a SAR response come from other organisations such as the National Antarctic Programs. There is therefore a need to assess how any requests for National Antarctic Program assistance or assets may affect the core business of that program, that is, what impact diversion of assets will have on science support, operations and logistics and safety of lives in those endeavours.
8. Many vessels currently operating in the Antarctic Treaty area are not IMO Polar Code compliant, as the code does not apply to all vessels. This may present a risk related to incident and accident and, suitability to conditions should be a consideration if a vessel of opportunity is being asked to respond to an incident.

9. Increase in activities in the Antarctic Treaty area is at least partially due to reduction in sea ice in some areas. The perception that reduction in sea ice might be a reduction in risk is not completely true as removal of sea ice often creates increase in icebergs, fog, stronger or more persistent winds, and creates rapidly changing conditions that many are not aware of or prepared for. Ice-breaking capable vessels will still be required in order to respond to Antarctic SAR events.
10. Each Antarctic SAR region is different and has different characteristics. For example, for the Peninsula, the distances from South America to the Antarctic Treaty area are relatively short. For the three other SAR regions, the distances are larger. However, even in relatively short distances (that are never less than 1000-1200 Kms), the particular circumstances of Antarctica-its hydrometeorological and ice conditions, the scarcity of support points and the limited infrastructure-mean there is a complexity to deployment. Time of arrival of SAR units is still very high compared to the expected survival time in the Antarctic.
11. When we speak of large distances, we are not only talking about having to wait for assistance for one or two days. In some cases, it would take five to six sailing days for a vessel to reach some areas of coastal Antarctica from outside the Antarctic Treaty area and this presumes good weather, and good sea and ice conditions.
12. The importance of collaboration is to “accomplish the mission” whatever that SAR mission happens to be.
13. When a SAR event is activated, agreements in place allow for direct communications between agencies. This is important given the time that would be required if government agencies needed to be consulted serially in a hierarchical sense or make agreements in order to react.
14. In some cases, including in urgent situations not at the level of a SAR event, government-to-government agreements are required before personnel and assets can be called upon to respond.
15. SAR agencies believe they speak a “common SAR language”. However, differences in domestic interpretation may mean we really are not always talking about the same thing. For example, what constitutes a “SAR” event may differ between countries. Some countries respond to these differences by creating a category system or a tiered system. Recognising the different types of Antarctic emergencies that can arise, one RCC uses a Category I and Category II system to determine the level of response required. For that particular RCC, Category I is a situation at a local level that is left to the resources of the National Antarctic Programs in the region of the emergency. Category II situations will involve the coordination of the response by the RCC.
16. Continuous information sharing amongst SAR agencies and between those agencies and the relevant National Antarctic Programs and other stakeholders is critically important; as is training and regional exercises, even though planning of such exercises is time-intensive.
17. Review after an event is an important part of the learning process and provides a

mechanism to share lessons learned that could require a policy or response change.

18. Even though there are significant differences between the Polar regions, there may be lessons Antarctic SAR agencies can learn from Arctic agencies.
19. International agreements and countries' commitments to those agreements are reflected in domestic policy.
20. SAR coordination and response requires medical/hospital facilities and assistance originating from external areas, such as the "gateway cities". Therefore, those cities require assets and human capability to respond adequately to a SAR situation. Acquiring and maintaining such assets are usually outside of the control of the RCC or the National Antarctic Program. Placement and maintenance of medical equipment in "gateway cities" is critical and requires continued investment by countries.
21. Strengthening of the planning process may go a long way to ensuring an effective emergency response. COMNAP workshops and AGM safety sessions are one-way to strengthen the planning process.
22. Some agencies are not equipped to deal with pollution or clean up that is often required after an Antarctic SAR incident.
23. In some SAR situations, it is simply not possible to provide any assistance.

Trends

24. There is a growth of tourism-related activity in the Antarctic Treaty area, particularly in the Peninsula. This growth is seeing more activities particularly through Frei Base and Marsh Aerodrome. The increase in numbers is coupled with a lengthening of the traditional Antarctic summer operational season. This may necessitate an extension to the current length of time SAR operations are required in the Peninsula. A reduction in sea ice in the Peninsula region, the implementation of the IMO Polar Code, and greater vessel fuel efficiencies, are all contributing factors to the extension of the traditional operational season.
25. Recently, insurance providers are becoming actively involved in any discussions of SAR events. That is, organisations and persons in the Antarctic Treaty area are taking out insurance in case of accident or incident. This may create a false sense of protection (that is, as long as I have insurance someone will come to my rescue) and adds a further complication to the response since insurance providers have to be involved in the conversation in cases where a SAR or emergency event has occurred.
26. Diversification of commercial activity continues, with an increase in air-cruise tourism activity, increase in rotary wing aircraft on-board Antarctic vessels and global increases in shipping and aviation activity. Such global trends will inevitably affect the Antarctic Treaty area in various ways. Diversification of science activities and its accompanying science support is increasing.

27. Mobile, internet-capable devices mean that information may be easily shared from the Antarctic Treaty area to a global audience, including the media. SAR agencies and National Antarctic Programs often find that in addition to launching an emergency response to an incident, they are also having to prepare a media response, or respond to social media, while also trying to ensure that families of those that may be involved in an accident or incident are part of clear lines of communications from reliable sources.
28. At least one country is currently considering extending its Antarctic SAR asset capabilities to cover more of their Antarctic SAR coordination area and to respond to a range of scenarios. This takes government investment.
29. For some countries with Antarctic RCC capabilities, there are currently no dedicated Antarctic SAR assets and sustained funding for assets that can be deployed to Antarctic conditions and across large distances is dwindling with little to no political support or consideration of the Antarctic situation and need. Continued, sustainable government commitment and funding is required but it often competes with other country needs. Because of the lack of government funding, new public-private partnerships are being formed.
30. People are embracing, and are better able than ever to afford, innovative technology. Such technology when used properly aids in a SAR event. For example, Personal Locator Beacons (PLBs) when properly registered and used can aid in the reducing the need for the search component of a response. More people are going to the Antarctic Treaty area and many of those are using PLBs. Some are used properly, some are not. RCCs are seeing an increase in PLB alarms and all alarms must be responded to, even those that turn out to be false alarms. There is also a challenge related to the number of providers of these PLBs and the differences between them. Some PLBs work to send the alarm to a commercial provider who only then pass information on to RCCs, whereas some go direct to the RCC.
31. At least one country is currently advocating for point of sale registration of PLBs with an estimate that currently 30% of PLBs sold in that country are used unregistered. There is an increase in false activations and in resale of PLBs that should not be used and should be disposed of properly. National Antarctic Programs and RCCs are encouraged to check (pre-deployment) for registration of PLBs that are going to be used in the Antarctic Treaty area.

Communication

32. Ability to talk with the right person/people at the needed time often makes the difference. Accurate information, provided in advance, is important and is the responsibility of all involved to ensure information is current.
33. During a SAR event, a common, consistent, correct message from all organisations involved is important. Integrity and timeliness of the message is critical especially when we all speak different first languages and when there is a need to make decisions quickly.

34. Workshop attendees benefit from the presentations and discussions, but the key messages and the presentations should be shared with a wider group. The COMNAP, the IAATO, the CCAMLR and Antarctic Treaty Secretariats have a role to play in this, as do the RCCs and the COMNAP Member National Antarctic Programs.
35. IAATO also recognises the need to share information and meets each season with RCCs to reduce risk related to their member activities, and also to remind RCCs of their members assets which might be called upon to assist in the event of a SAR incident. Further consideration of how best to share this IAATO information should be considered.
36. In most cases, we talk about good communications between the National Antarctic Programs and their relevant RCC. In a couple of cases, these are the same people/same organisations, especially in the cases where the military agencies provide National Antarctic Program operations and logistics and are also part of the RCCs.
37. COMNAP tools are assisting RCCs and National Antarctic Programs to understand what assets are where in the Antarctic Treaty area, however, there is no overall awareness including where dedicated RCC assets may be located at any point in time. In time, the COMNAP Asset Tracking System (CATS) tool might be expanded to include location of assets beyond the Antarctic Treaty area and beyond those in support of National Antarctic Program activities only.
38. The COMNAP Accident Incident and Near-Miss Reporting (AINMR) system was designed at the request of COMNAP Member National Antarctic Programs in order to share lessons learned in the case of an accident, incident or near miss event. It was under-used during the six-year period it was available. The COMNAP AGM decided to withdraw support for the AINMR tool. However, sharing of post-incident review documents is still a valuable learning tool and reports of lessons learned can be shared by way of the COMNAP Members' Only webpage. Other mechanisms to share such information should continually be explored.
39. The COMNAP SAR webpage was developed in response to previous Antarctic SAR workshops as an identified need to assist communications and response. It is available but being under-utilized by the RCCs. There may be other ways (other than triennial workshops and SAR webpages) to share information.
40. It is important for RCCs and National Antarctic Programs to have a consistent approach to social media/media requests and statements in order to give clarity to the message. Some countries have a media protocol agreed between their RCC and their National Antarctic Program. Such protocols should be shared on the COMNAP SAR webpage.
41. Changeover of personnel mean that regular training and regular workshop are important. The current triennial pacing of the COMNAP Antarctic SAR Workshops is well matched with the need to continually reinforce cognizance as personnel turnover and new matters of improvement may be identified and implemented.

Agenda item 4

Key messages from the fisheries and aviation sectors

42. The CCAMLR Secretariat, like most of the other Antarctic Treaty-related Secretariats is a data collection hub and receives a range of data. Of key importance as regards SAR, is the near real-time vessel position data (VMS) from certain, but not all, vessels in the CCAMLR area that, by agreements between CCAMLR and each RCC with Antarctic SAR coordination responsibility, may be released to a RCC in support of a SAR event. Otherwise, the VMS data is treated as confidential/commercially sensitive. CCAMLR CM-10-04 provides the framework for the operation of VMS data and provides for authorised use.
43. There are currently 48 vessels licensed to fish in the CCAMLR area active in different zones at different times of the year. From 1 December 2019, these fishing vessels will be required to position report into the VMS on an hourly basis.
44. The level of activity related to fisheries/krill harvest varies through-out the year and by CCAMLR area.
45. While it is recognised that the largest number of tourists enter the Antarctic Treaty area through the Peninsula region on a marine vessel, there are also a growing number of tourist activities associated with aviation and remote field locations. Cruise activity is supported by shore activities while remote field activity is supported by flights and land vehicle traverse.
46. Recently, new commercial operators are participating in remote activities for tourists and have developed their own infrastructures including runways. Information in relation to such infrastructures should be included in the COMNAP electronic-Antarctic Flight Information Manual (e-AFIM).
47. While the RCCs have good awareness of marine-based activity and of National Antarctic Program air operations in their area of responsibility, there is uncertainty over coverage of land-based activity and variation in coordination responsibility of such activity. In cases of land-based SAR response in the Antarctic Treaty area, National Antarctic Programs are often called upon to coordinate and supply the assets and personnel for a response. Non-governmental operators can also be called upon to respond.
48. There is no overall awareness of assets that might be called upon to respond to a land-based emergency. All operators should provide their information into one system for operational awareness; this might include all land vehicles.
49. IAATO already has the Marine Emergency and Medical Evacuation Response (EMER) plan and currently IAATO air operators are reviewing an equivalent response plan for flight activities.
50. IAATO air operators are currently using the Automated Flight Following (AFF) system to track aircraft. Some are also reporting position data into the CATS. Addition of details of

tracked assets would further enhance the value of CATS.

51. The COMNAP e-AFIM and the SCAR Air Operations Planning Map Series are tools welcomed by the community and are used to assist with flight planning. They rely on current and complete information as provided by National Antarctic Programs and other operators. There was a suggestion that the SCAR Air Operations Planning Maps should be included in the e-AFIM.
52. At present, national competent authorities are permitting or authorising requests from air operators for Antarctic Treaty area activities. Each permitted or authorised activity may have SAR implications for other actors that are not likely being considered by the competent authority. Often the activity is permitted or authorised without broader consideration for safety or whether the pilot or the equipment is fit for purpose. Often the activity is not made known to the relevant RCC or the National Antarctic Programs with facilities or operations in the area of the proposed activity. It is not usual for the COMNAP Secretariat to have awareness of such permitted or authorised activity as the competent authority does not have to make the COMNAP Secretariat aware of any activity. Consideration should be given as to whether the process can better involve the RCCs and National Antarctic Programs and the COMNAP Secretariat or at the very least communicate the details of the proposed activities to the relevant RCC.
53. A recent COMNAP survey of Antarctic air operations and aviation activity revealed that there is an increase in rotary wing aircraft in operation. The COMNAP ATCM XLII IP002 contains information on air operations and this information will support an ATCM Working Group 2 focused discussion on air activity in Antarctica.
54. In addition to the Information Paper, COMNAP has also submitted COMNAP ATCM XLII WP008 with recommendations for the ATCM to consider. These recommendations include ensuring information share is continued in support of e-AFIM and the Antarctic Telecommunications Operators Manual (ATOM) and other information exchange tools.
55. Antarctic airspace is uncontrolled airspace. Technologies such as Traffic Collision Avoidance System (TCAS) should be utilized in all fixed wing and rotary aircraft in order to de-conflict airspace. There is currently no mandatory requirement for TCAS to be installed and turned on, although Traffic Information Broadcasts by Aircraft (TIBA) as recommended by ICAO Annex 11 is still recommended for use in ATCM XXXVI Resolution 1 (2013) and procedures are explained in e-AFIM Appendix 5. TCAS is a technology advancement on the TIBA system and does not require VHF transmissions.
56. The CATS seems to be a good short-term, position reporting system that can be used to understand where vessel and aircraft assets are at any given time in the Antarctic Treaty area. However, not all vessels can use the system due to limited bandwidth and not all vessels and aircraft are reporting. In the longer term, off-the shelf products may be a better option than CATS to combine data from multiple sources.
57. Regardless of the position reporting/tracking platform used, military aircraft and military vessels often do not report their position information into any such systems. This means

there is never a complete picture of air operations nor vessels in the Antarctic Treaty area.

58. Some regions outside of the Antarctic, are requiring and implementing Automatic Dependent Surveillance – Broadcast (ADS–B) in aircraft and on the ground in order to facilitate airborne traffic situation awareness, spacing, separation and self-separation. Such technologies will have application in the Antarctic Treaty area and should be considered by the ATCM for mandatory implementation across all aircraft carrying people.
59. COMNAP systems are attempting to track all vessels and aircraft but of course only include COMNAP Member information. Other Antarctic-related organisations are tracking their members' assets. There is no one integrated system and we have a way to go before achieving that. When considering SAR, it is something we should all strive for and support.
60. It was recognised that the Notice to Airmen (NOTAM) system is a way to convey information, not sufficiently known in advance to publicize by other means, on the establishment, condition or change in any component of the air operations system. Pilots are required to review all NOTAMs affecting their flight route before take-off. However, in the Antarctic Treaty area NOTAMs are not consistently used since it is uncontrolled airspace. There is a link to the Federal Aviation Administration (FAA) NOTAM search webpage from the COMNAP Air Operations Expert Group webpage, but COMNAP does not have oversight of Antarctic-related NOTAMs nor would it be practical for COMNAP to oversee a NOTAM system for the Antarctic Treaty area.
61. All air operators should be required to communicate to all airfields in their area of operations to ensure they are aware of any flights in the area, especially in cases where a runway may be used as an alternate landing site.
62. Regionally, there are air operations 'hubs' or air operations communication centres that use 'internal' tracking and monitoring platforms in order to have visibility and oversight of air operations in that particular region. Many National Antarctic Programs stations use public, internet-based apps or software to get a picture of air operations in their area.

Agenda item 5

Key Messages from National Antarctic Programs

63. National Antarctic Programs must follow national legislation, which therefore feeds into Antarctic operations and into SAR policy, guidance and response.
64. National Antarctic Programs continue to stress the importance of international cooperation in order to be successful and safe in the Antarctic. Efforts spent building relationships are never time wasted.
65. More than half of all COMNAP Member National Antarctic Programs responded to a COMNAP survey that they are planning for, or are in the process of, modernization of their infrastructure. Infrastructure projects tend to add complexity and people to Antarctic

operations.

66. National Antarctic Program operations are changing. Examples of change include the opening and operation of new runways and heliports, the extension of operations by ground traverse, the addition of new icebreakers to the fleet and the expansion of periods of Antarctic operations of support to science. There is also planned builds of Antarctic stations and other infrastructure beginning. Some of these changes have benefits when SAR responses are needed and in reducing fuel usage. There have been upgrades to infrastructures and additional assets and technology capabilities, such as air capabilities and imagery capabilities, which are enhanced resources for SAR situations.
67. Some National Antarctic Programs are seeing changes in their station personnel demographics, such as, an increase in the average age of station personnel. This brings with it changes in medical situations and medical conditions in individuals. There has been an increase in medevacs but it is not clear if this is related to risk aversion (i.e. removing a patient just to be “on the safe side”) or a real increase in medical incidents than in the past. Based on past experiences, some programs require that their personnel undergo appendix removal operations before deployment in order to reduce risk by eliminating the need for appendectomy.
68. Only a few countries operate inter-continental air operations. Many more operate inter-continental ship operations for passengers and for movement of cargo and fuel. Aircraft and crews, and vessels and crews, are often chartered by the National Antarctic Program to carry out a specific amount of operations and logistics. Some charters are long-term agreements; others are made on an annual basis. In the event the agreement is for some reason not met, it is often difficult to find alternative arrangements and providers especially on short notice and especially given the particulars of Antarctic operations.
69. Programs are working hard to ensure in the case of their personnel that the ‘search’ component is not necessary in an emergency. That is, that there are good systems and technologies in place to ensure the whereabouts of all program personnel are always known while in the Antarctic. Often, simple systems such as an easy to view station “muster” board and a row/column grid system on maps of the immediate area surrounding a station can be extremely useful and easy to use by everyone in an emergency.
70. In the event of an incident that requires station personnel to participate in a SAR event, pre-deployment training is important, as is ensuring all personnel have an understanding of the equipment that will be used in a SAR situation. Equipment such as ropes, fire extinguishers, patient movement equipment are a few examples. In order for programmes to share or exchange personnel, there should be a common approach to training or greater collaboration on training across programs.
71. Personnel should be encouraged to speak up when they see something that appears to be a “normalisation of deviance”. That is, something may have been done a particular way for many years, however, that does not make the practice or procedure correct or even safe. New personnel bring fresh knowledge that should be considered and encouraged. There are different understandings of risk. Certainly, risk increases when “at the extreme” is seen

as “normal” or “doable”.

72. Some National Antarctic Programs are establishing “assurance” boards, or external expert panels that can be called upon to consult on a particular problem, project or issue. Such independent consultants are likely to be in a position to ask the difficult questions that internal persons may be afraid to ask.
73. Due to Antarctic conditions there are limited time windows for particular types of operation. For example, sea ice conditions play a key role not only for vessel operations but also for how long each season sea ice runways can be safely utilized.
74. Australia has developed expertise on polar medicine including deep field medicine that they are hoping to share with other National Antarctic Programs.
75. There are low frequency, but high impact SAR events. Planning for those must be done on a regular basis, especially when new personnel are involved each year and may not have experienced a particular low frequency event during their career.
76. While most SAR situations focus on the marine and coastal Antarctic environments, inland Antarctic stations are called on to render medical assistance or are used in the response plan chain.

Agenda items 6

COMNAP products and tools

77. COMNAP is an organisation that can assist in the development of resources, products and tools with input from the community.
78. Existing products include the ATOM, the e-AFIM, the CATS (an upgrade to the Ship Position Reporting System (SRRS)) and the Antarctic Station Catalogue (printed, downloadable PDF and as GIS layer). Simple information exchange is also very important, and this is partially achieved by the COMNAP Regional Breakout Groups Information Exchange template.
79. The ATOM is a good tool for sharing points of contact and details for National Antarctic Program vessels, stations, program managers and deputy managers and the RCC points of contact. It should be regularly reviewed by all those whose information is included to ensure the information is correct and any changes required should be immediately informed to the COMNAP Secretariat. All National Antarctic Programs have access to ATOM by way of the COMNAP Members-only website and all National Antarctic Programs could share the ATOM with their Government Ministries.
80. The time to look at the currency of the information in the ATOM and e-AFIM is not at the time of a SAR incident. It is important for everyone to regularly review the information in ATOM and e-AFIM and regular review of these products should be added to the work programmes of at least one person from each National Antarctic Program and SAR agency.

81. The CATS tool is currently under development. It has made an advance on the SPRS in regard to sending in position data-which can now be done automatically from a ship or aircraft, but there is still some work to be done in order to provide the overall picture of assets to vessels in the Antarctic Treaty area that may have limited bandwidth for interacting with CATS. New technologies may assist with this in the near future.
82. Beyond COMNAP, ranges of other tools exist. These include sea ice imagery technologies, mapping products, Remotely Piloted Aircraft Systems (RPAS)-related technologies, satellite communications technologies and coverage, and many more. Sharing the information on proven technologies is a primary goal of COMNAP through its Advancing Critical Technologies Expert Group.
83. The COMNAP Secretariat, webpages and the Annual General Meeting can assist with collective solutions if National Antarctic Programs come prepared with the information to exchange and discuss. While the COMNAP Secretariat can assist, there is no resource for the Secretariat to be a 24/7 coordination response hub, this should be left in the hands of the RCCs and the National Antarctic Programs involved.

Agenda item 7

Lessons learned from recent real events

Real Event 1: Fire at Bahia Fildes

Key lessons learned:

- i. Routine inspection of the building involved did not detect a potential problem. The fire once started may have been undetected for several minutes because it began in a building roof space. Inspections that are more frequent are required coupled with improvements in fire detection systems.
- ii. No one in the base was injured or killed due to immediate evacuation according to the evacuation plan in place. The importance of an evacuation plan is highlighted coupled with regular training exercises and regular fire escape drills.
- iii. The placement of fire-fighting equipment meant that the closest equipment to the fire could not be accessed. Fire-fighting equipment from the airfield was brought to the scene but had to be refilled away from the site of the fire and all this took time.
- iv. Antarctic conditions were very challenging-extreme cold and high winds hindered the ability to fight the fire and to keep water in a liquid state.
- v. The prevailing wind direction during the fire meant that nearby buildings were in danger of alighting. This was prevented due to good response, but people in the other building also had to be evacuated. Extending the distance between buildings is costly and may be a safety issue of its own but proximity of building and prevailing wind direction should be considered when planning a new build.
- vi. All personnel affected had to have shelter in a “place of safety”, away from the danger of fire and sheltered from Antarctic conditions. This was only possible due to the vicinity of other building nearby. Not all Antarctic facilities have nearby/neighbouring suitable facilities.
- vii. Many countries came to the aid of Chile during the fire and all wanted to help, but the lack

of water was the key factor. After the fire was extinguished, many countries were able to support the continued functioning of the Chilean Navy program and offered temporary facilities so there could be continuation of the work normally performed at the facility that was destroyed.

- viii. Clean-up efforts are a major component of such incidents and take a long time to complete. Those efforts are important but they do affect normal operations.
- ix. The cause of the fire was poor condition of wiring in the building. Antarctic conditions can mean that wiring insulation is made brittle and affects performance timeframes, so should be checked more often than what would be usual in other latitudes.

Real Event 2: Medical evacuation

Key lessons learned:

- i. A medical evacuation or “medevac” is not universally defined as a SAR event by all National Antarctic Programs and all RCCs, and therefore may not be strictly appropriate to discuss as part of a SAR Workshop.
- ii. In many cases, a medevac does not require immediate reaction and response, but is an action carried out after pre-planned discussion based on the patients situation. It may require assistance from another agency or country, but is not an obligation, or can be carried out by one agency or country on its own.
- iii. The distinction is important because for SAR events, most countries have policy in place that allows the SAR agency and National Antarctic Program to work together with other countries without obtaining prior permission from their ministries and authorities to do so for the particular event. The distinction is also important in the context of insurance and cost recovery.
- iv. For a non-SAR medical situation, it is advisable that National Antarctic Programs communicate directly with each other to coordinate a medical response or evacuation.
- v. In medical situations, it is still encouraged to keep the RCC informed as they might contribute with their oversight of organisations that might be able to assist.
- vi. Further discussion may be needed at the COMNAP AGM to ensure we understand the meaning of terms such as “medevac” and “medical transfer” and to understand appropriate lines of communication in the event of medical requests.

Agenda item 8

Regional Mass Rescue Operation (MRO) Scenarios Workshop

Background to agenda item 8

The ATCM XL (2017) Final Report notes in paragraph 240, that “The United States presented IP 72 Antarctic Mass Rescue Operations Response and Preparedness Challenges, which provided an overview of the challenges associated with responding to a mass rescue operation (MRO) in the Antarctic Treaty Area for land, air or sea SAR incidents... Stressing that an effective MRO response relied upon the development of a realistic and effective contingency plan and exercises to test the plan...” COMNAP welcomed the suggestion to include an MRO scenario on the SAR Workshop IV Agenda.

A MRO is one that involves the need for immediate assistance to large numbers of persons in distress such that capabilities normally available to SAR authorities are inadequate (IMO

definition).

The objective of this agenda item was to develop a response to three specific scenarios to evacuate survivors to an initial place of safety and to discuss planning considerations for repatriation of survivors from the Antarctic environment. The three regional MRO scenarios were identified, requiring planning and response to an aviation, land and marine incident respectively. In preparation for the workshop, SAR Authorities from Argentina and Chile (Peninsula Region), South Africa and Australia (Dronning Maud Land/East Antarctica) and New Zealand (Ross Sea) selected a specific SAR incident appropriate to their respective regions. These RCCs collaborated with the National Antarctic Programs and other agencies in their regions prior to the workshop to discuss planning around response options and capabilities.

Full scenarios were presented. Below are the “keys to success” as identified during discussions.

MRO Scenario Workshop Outcomes and “Keys to Success”

Region: Peninsula

Scenario: Aviation – missing aircraft ditched into the sea

- An aviation accident becomes a SAR in the terrestrial or in the marine environment. In this particular case, there is approximately a 30-minute survival time in the water. In other parts of the Antarctic, survival times will be much less. To have any chance of survival depends on preparations and pre-planning before any accident.
- The possibility of rescuing survivors in a SAR situation caused by the emergency of an aircraft that ditches into Antarctic waters is low. The probability will vary depending on the prevailing weather conditions and the relative position of aerial and surface means operating in the area, which will determine the time of arrival of SAR units to the impact position.
- An increase in global flight activity is heightening concerns related to aviation accidents of global-routed planes, for example for flights route between South America and Oceania that cross the Antarctic over areas of the Southern Ocean. An accident involving any of these large commercial aircraft would require a swift and coordinated response to have any chance at finding any survivors.
- The Argentina and Chile RCCs cooperate throughout their SAR Regions (SRRs), not just in the Antarctic. This constant partnership adds value when Antarctic SAR is required.
- The Argentina and Chile RCCs have a mature relationship with the National Antarctic Programs that have been operating in the Peninsula for some time.
- In the event of a MRO close to the Peninsula or in the Peninsula itself, National Antarctic Program personnel, facilities and assets will be called upon to assist in the search, recovery, and to support/house or repatriate survivors. Therefore, National Antarctic Programs in the vicinity of an MRO should be made aware of the accident by the coordinating RCC as soon in the process as possible. IAATO should also be informed.
- Many SAR assets in the Peninsula region are available to respond all-year-round. Between November 30th and March 30th, the Combined (Argentina and Chile) Naval Antarctic Patrol (PANC) is carried out. This assures that a ship is permanently in the Antarctic area to attend to emergencies in the SAR sector of the Peninsula.
- “Assets” can include facilities, such as, the permanent operation of the Marsh Aerodrome that is used for performing SAR operations including evacuations, to the benefit of all the Antarctic facilities in the Peninsula.

- An Air Force capability and responsibility in SAR operations gives an advantage and offers immediacy to the execution of SAR missions as soon as possible from Presidente Frei Station or from the continent.
- Operation of the Cospas-Sarsat satellite segment (Chilean Mission Control Centre (CHMCC)) is important since it alerts the aeronautic SAR and the maritime SAR, as well as other ground rescue organizations.
- Short inter-continental Antarctic flying distance coupled and permanent air connectivity with year-round Frei Station allows for the transfer, in a short period of time, SAR air assets to support the Antarctic SAR operation whether they are an air, sea or land accidents.

Region: Dronning Maud Land/East Antarctica

Scenario: Marine – ship disabled and adrift

- Determination of the coordinating SAR authority is a significant consideration, with the emphasis being on the agency “best placed” to take the lead role. This provides the legal framework for the response.
- Collaboration between multi-national organisations is vital, not just during incidents. The unique nature and the harsh isolated environment of Antarctica makes having the bigger picture regarding asset availability essential. COMNAP can be instrumental in achieving this.
- Understanding that language can be a barrier, as can large distances in this region.
- Longer-term considerations such as survivor repatriation, supplies and vessel salvage, need to be addressed early due to their often complex nature and the long lead times involved.
- Having the “bigger picture” regarding asset availability is extremely important.

Region: Ross Sea

Scenario: Land – outbreak of highly contagious virus at a remote field camp

- Early identification of situation and having contingency plans (different weather situations) is critical.
- Patients need to be isolated to prevent the spread of disease, but they also need medical care from someone in the remote field camp.
- The possibility needs to be considered that the medical provider may become unwell.
- Understanding that in a remote field camp, while there are usually plenty of provisions and resources, they are still limited to a certain period of time. There are also transportation limitations due to distance, weather and terrain, and expertise in case of the need to land traverse patients back out of the field.
- It is important to have awareness of the capabilities / resources available to other RCC’s, National Antarctic Programs and NGO’s, and the coordinating body should be ready to reach out to all available agencies (government and NGO) that may be in a position to assist.
- Utilise COMNAP resources as a way of sharing information. The COMNAP SAR page and CATS can help identify both risks and resources.

A consistent key to success identified across all regions was the need for close cooperation between RCCs and National Antarctic Programs, both within and across regions. Critical to achieving this is knowing which agency to contact and how to contact them. The ATOM was identified as a useful resource, but to be effective all agencies needed to ensure their contact information was regularly updated and always current.

Appendix 1: SAR Workshop IV Registration List

1a: Wellington Workshop Delegates					
Name	Surname	Role	Organisation	Country	Email address
Mariana	Alvarez-Rodriguez	Deputy Head of Mission	Embassy of the Argentine Republic in New Zealand	Argentina	mrv@mrecc.gov.ar
Rocco	Ascione	Logistic Service	ENEA	Italy	rocco.ascione@enea.it
Gianluca	Bianchi Fasani	Head of Logistic Service	ENEA	Italy	gianluca.bianchifasani@enea.it
Jared	Blows	MRCC Chief	South African Maritime Safety Authority (SAMSA)	South Africa	jblows@samsa.org.za
Andrew	Burden	Senior SAR Officer (Aviation)	Australian Maritime Safety Authority (AMSA)	Australia	awb@amsa.gov.au
Nicola	Burgess	Antarctic Programme Planner	Antarctica New Zealand	New Zealand	n.burgess@antarcticnz.govt.nz
Lars	Christiansen	Head of Antarctic Affairs	Armada de Chile (Navy)	Chile	christiansenp@gmail.com
Vincenzo	Cincotti	Head of Technical Antarctic Unit	ENEA	Italy	vincenzo.cincotti@enea.it
Robb	Clifton	Operations Manager	Australian Antarctic Division (AAD)	Australia	robb.clifton@aad.gov.au
Brendan	Comerford	Manager	Maritime Operations Centre (MOC)	New Zealand	brendan.comerford@kordia.co.nz
Christian David	Corona	Chief of MRCC Puerto Belgrano	Argentine Navy	Argentina	cdcorona@ara.mil.ar
Mark	Dittmer	Senior Communications and Media Advisor	Maritime New Zealand	New Zealand	mark.dittmer@maritimenz.govt.nz
Catherine	Dymock	Staff Officer Planning: Domestic and Regional Operations HQJFNZ	New Zealand Defence Force	New Zealand	catherine.dymock@nzdf.mil.nz
Kelly	Falkner	Director, OPP & USAP / COMNAP Chair	National Science Foundation (NSF) / COMNAP EXCOM	USA	kfalkner@nsf.gov
Jack	Fenaughty	Fisheries Operations Consultant	New Zealand Industry Toothfish Committee	New Zealand	jack@silvifishresources.com
Duncan	Ferner	Manager NZSAR Secretariat	New Zealand Search and Rescue (NZSAR)	New Zealand	d.ferner@nzsar.govt.nz
Michelle	Finnemore	Executive Secretary	COMNAP Secretariat	New Zealand	michelle.finnemore@comnap.aq
Aurora	Fleming	CDR, U.S. Coast Guard	Coast Guard Office of Search and Rescue Policy	USA	Aurora.I.Fleming@uscg.mil
Cindy	Francis	Senior SAR Mission Coordinator (Maritime)	Australian Maritime Safety Authority (AMSA)	Australia	cjf@amsa.gov.au
Wei	Fuhai	Head of Expedition and Operation Department	Polar Research Institute of China (PRIC)	China	chengxuyu@Pric.org.cn
Chris	Gallagher	Field Support & Emergency Management Coordinator	Australian Antarctic Division (AAD)	Australia	chris.gallagher@aad.gov.au
Simon	Garrod	Director of Operations	British Antarctic Survey (BAS)	UK	smga@bas.ac.uk
John	Garton	Staff Officer Planning: Domestic and Regional Operations HQJFNZ	New Zealand Defence Force	New Zealand	john.garton@nzdf.mil.nz
Luke	Gaskin	Senior Policy Officer	Ministry of Foreign Affairs and Trade (MFAT)	New Zealand	luke.gaskin@mfat.govt.nz
Harvey	Goodwin	Field Safety Officer	Norwegian Polar Institute (NPI)	Norway	Harvey@npolar.no
Kyle Wesley	Grove	Assistant SMC	ATNS: ARCC	South Africa	kylewgr@yahoo.com
Mike	Hill	Manager JRCNZ and Safety Services	Maritime New Zealand	New Zealand	Mike.Hill@maritimenz.govt.nz
Greg	Johnston	Senior Search and Rescue Officer, Lead Antarctic SAR	Joint Rescue Coordination Centre New Zealand (JRCNZ)	New Zealand	greg.johnston@maritimenz.govt.nz
Christoph	Kasch	Polar Logistics Manager	Federal Institute for Geosciences and Natural Resources (BGR)	Germany	Christoph.Kasch@bgr.de
Lisa	Kelley	Head of Operations	International Association of Antarctica Tour Operators (IAATO)	USA	lkelley@iaato.org
Margaret	Knuth	USAP Operations Manager	National Science Foundation (NSF)	USA	mknuth@nsf.gov
Hyung-Geun	Lee	Head of Logistics and Operation	Korea Polar Research Institute (KOPRI)	Republic of Korea	hglee@kopri.re.kr
Chunlei	Li	Division of Finance and Operation	Chinese Arctic and Antarctic Administration (CAA)	China	lichunlei@caa.mnr.gov.cn
Sven	Lidstrom	Operations Coordinator	Norwegian Polar Institute (NPI)	Norway	sven.lidstrom@npolar.no
Steve	Lock	MPI NMCC-LO	Ministry for Primary Industries (MPI)	New Zealand	steve.lock@mpi.govt.nz
Elke	Louw	Manager Marine and Regional Weather Services	MetService	New Zealand	elke.louw@metSERVICE.com
Santiago Mauricio	Madrid	Chilean Air Force Antarctic Adviser	Chilean Antarctic Program	Chile	smadrid@fach.mil.cl
Keith	Manch	Director	Maritime New Zealand	New Zealand	Keith.Manch@maritimenz.govt.nz
Cathie	McGregor	Senior International Advisor, Policy Development & System Design	Maritime New Zealand	New Zealand	Cathie.McGregor@maritimenz.govt.nz
Louise	Proctor	Manager Response Policy	Australian Maritime Safety Authority (AMSA)	Australia	louise.proctor@amsa.gov.au
David	Rootes	ALE Environmental Logistics	International Association of Antarctica Tour Operators (IAATO)	UK	david.rootes@antarctic-logistics.com
Paul	Sheppard	USAP Chief Program Manager	National Science Foundation (NSF)	USA	psheppar@nsf.gov
Ben	Smith	P3-K Planner - HQJFNZ	New Zealand Defence Force	New Zealand	benjamin.smith@nzdf.mil.nz
Evan	Solly	Master Tangaroa	National Institute of Water and Atmospheric Research (NIWA)	New Zealand	e.solly@gmail.com
David	Stevens	Senior Fisheries Analyst	Ministry for Primary Industries (MPI)	New Zealand	dave.stevens@mpi.govt.nz
Andrew	Thornton	Senior National Officer (NZDF)	Antarctica New Zealand	New Zealand	a.thornton@antarcticnz.govt.nz
Simon	Trotter	General Manager of Antarctic Operations	Antarctica New Zealand	New Zealand	s.trotter@antarcticnz.govt.nz
Murray	Tuffin	Maritime Lead - Capability Branch, HQNZDF	New Zealand Defence Force	New Zealand	murray.tuffin@nzdf.mil.nz
David	Wilson	Watch Leader, Senior SAR Officer	Rescue Coordination Centre New Zealand (RCCNZ)	New Zealand	David.Wilson@maritimenz.govt.nz
Chris	Wilson	Senior Search and Rescue Officer	Joint Rescue Coordination Centre New Zealand (JRCNZ)	New Zealand	Chris.Wilson@maritimenz.govt.nz
Rob	Wooding	General Manager Support & Operations	Australian Antarctic Division (AAD)	Australia	rob.wooding@aad.gov.au
Cheng	Xuyu	Engineer	Polar Research Institute of China (PRIC)	China	chengxuyu@Pric.org.cn

1b: Christchurch Workshop Delegates					
Name	Surname	Role	Organisation	Country	Email address
Mariana	Alvarez-Rodriguez	Deputy Head of Mission	Embassy of the Argentine Republic in New Zealand	Argentina	mrv@mrecc.gov.ar
Rocco	Ascione	Logistic Service	ENEA	Italy	rocco.ascione@enea.it
Gianluca	Bianchi Fasani	Head of Logistic Service	ENEA	Italy	gianluca.bianchifasani@enea.it
Jared	Blows	MRCC Chief	South African Maritime Safety Authority (SAMSA)	South Africa	jblows@samsa.org.za
Matt	Brown	Antarctic Programme Planner	Antarctica New Zealand	New Zealand	M.Brown@antarcticnz.govt.nz
Andrew	Burden	Senior SAR Officer (Aviation)	Australian Maritime Safety Authority (AMSA)	Australia	awb@amsa.gov.au
Nicola	Burgess	Antarctic Programme Planner	Antarctica New Zealand	New Zealand	n.burgess@antarcticnz.govt.nz
Lars	Christiansen	Head of Antarctic Affairs	Armada de Chile (Navy)	Chile	christiansenp@gmail.com
Vincenzo	Cincotti	Head of Technical Antarctic Unit	ENEA	Italy	vincenzo.cincotti@enea.it
Robb	Clifton	Operations Manager	Australian Antarctic Division (AAD)	Australia	robb.clifton@aad.gov.au
Andrea	Colombo	Research and Project Development Manager	COMNAP Secretariat	New Zealand	andrea.colombo@canterbury.ac.nz
Brendan	Comerford	Manager	Maritime Operations Centre (MOC)	New Zealand	brendan.comerford@kordia.co.nz
Christian David	Corona	Chief of MRCC Puerto Belgrano	Argentine Navy	Argentina	cdcorona@ara.mil.ar
Brian	Crocker	VP & COO	Kenn Borek Air Ltd	Canada	brocker@borekair.com
Kelly	Falkner	Director, OPP & USAP / COMNAP Chair	National Science Foundation (NSF) / COMNAP EXCOM	USA	kfalkner@nsf.gov
Michelle	Finnemore	Executive Secretary	COMNAP Secretariat	New Zealand	michelle.finnemore@comnap.aq
Aurora	Fleming	CDR, U.S. Coast Guard	Coast Guard Office of Search and Rescue Policy	USA	Aurora.I.Fleming@uscg.mil
Cindy	Francis	Senior SAR Mission Coordinator (Maritime)	Australian Maritime Safety Authority (AMSA)	Australia	cjf@amsa.gov.au
Wei	Fuhai	Head of Expedition and Operation Department	Polar Research Institute of China (PRIC)	China	chengxuyu@Pric.org.cn
Chris	Gallagher	Field Support & Emergency Management Coordinator	Australian Antarctic Division (AAD)	Australia	chris.gallagher@aad.gov.au
Simon	Garrod	Director of Operations	British Antarctic Survey (BAS)	UK	smga@bas.ac.uk
Harvey	Goodwin	Field Safety Officer	Norwegian Polar Institute (NPI)	Norway	Harvey@npolar.no
Kyle Wesley	Grove	Assistant SMC	ATNS: ARCC	South Africa	kylewgr@yahoo.com
Gudmundur	Gudjonsson	Arctic Trucks	International Association of Antarctica Tour Operators (IAATO)	Iceland	gudmundur@arctictrucks.is
John	Guldahl	Director Operations and Logistics / COMNAP Vice Chair	Norwegian Polar Institute (NPI) / COMNAP EXCOM	Norway	gulda@npolar.no
Gen	Hashida	Deputy Director/Professor Center for Antarctic Program	National Institute of Polar Research (NIPR)	Japan	gen@nipr.ac.jp
Richie	Hunter	Program Support	Antarctica New Zealand	New Zealand	maindivide@gmail.com
Greg	Johnston	Senior Search and Rescue Officer, Lead Antarctic SAR	Joint Rescue Coordination Centre New Zealand (JRCNZ)	New Zealand	greg.johnston@maritimenz.govt.nz
Christoph	Kasch	Polar Logistics Manager	Federal Institute for Geosciences and Natural Resources (BGR)	Germany	Christoph.Kasch@bgr.de
Lisa	Kelley	Head of Operations	International Association of Antarctica Tour Operators (IAATO)	USA	lkelley@iaato.org
Simone	Kent	Administration Officer	Antarctica New Zealand	New Zealand	s.kent@antarcticnz.govt.nz
Margaret	Knuth	USAP Operations Manager	National Science Foundation (NSF)	USA	mknuth@nsf.gov
Hyung-Geun	Lee	Head of Logistics and Operation	Korea Polar Research Institute (KOPRI)	Republic of Korea	hglee@kopri.re.kr
Jonathan	Leitch	Engineering Solutions Manager	Antarctica New Zealand	New Zealand	J.Leitch@antarcticnz.govt.nz
Chunlei	Li	Division of Finance and Operation	Chinese Arctic and Antarctic Administration (CAA)	China	lichunlei@caa.mnr.gov.cn
Sven	Lidstrom	Operations Coordinator	Norwegian Polar Institute (NPI)	Norway	sven.lidstrom@npolar.no
Santiago Mauricio	Madrid	Chilean Air Force Antarctic Adviser	Chilean Antarctic Program	Chile	smadrid@fach.mil.cl
Stuart	McFadzean	White Desert Operations Manager	International Association of Antarctica Tour Operators (IAATO)	Australia	stuart@white-desert.com
Louise	Proctor	Manager Response Policy	Australian Maritime Safety Authority (AMSA)	Australia	louise.proctor@amsa.gov.au
Wolfgang	Rack	External speaker	Gateway Antarctica, University of Canterbury	New Zealand	wolfgang.rack@canterbury.ac.nz
David	Rootes	ALE Environmental Logistics	International Association of Antarctica Tour Operators (IAATO)	UK	david.rootes@antarctic-logistics.com
Nathan	Russ	Director of Operations	Heritage Expeditions 2018	New Zealand	nathan.russ@heritage@gmail.com
Paul	Sheppard	USAP Chief Program Manager	National Science Foundation (NSF)	USA	psheppar@nsf.gov
Evan	Solly	Master Tangaroa	National Institute of Water and Atmospheric Research (NIWA)	New Zealand	e.solly@gmail.com
Andrew	Thornton	Senior National Officer (NZDF)	Antarctica New Zealand	New Zealand	a.thornton@antarcticnz.govt.nz
Priti	Tisler	Logistic Science Support	Finnish Antarctic Research Program / Finnish Meteorological Institute	Finland	priti.tisler@fmi.fi
Simon	Trotter	General Manager of Antarctic Operations	Antarctica New Zealand	New Zealand	s.trotter@antarcticnz.govt.nz
Carl	van der Meulen	Senior Advisor	New Zealand Search and Rescue (NZSAR)	New Zealand	c.vandermeulen@gmail.com
Bonney	Webb	Fishery Monitoring and Compliance Manager	Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) Secretariat	Australia	bonney.webb@ccamlr.org
Christine	Wesche	Logistic Support	Alfred Wegener Institute (AWI)	Germany	christine.wesche@awi.de
David	Wilson	Watch Leader, Senior SAR Officer	Rescue Coordination Centre New Zealand (RCCNZ)	New Zealand	David.Wilson@maritimenz.govt.nz
Chris	Wilson	Senior Search and Rescue Officer	Joint Rescue Coordination Centre New Zealand (JRCNZ)	New Zealand	Chris.Wilson@maritimenz.govt.nz
Rob	Wooding	General Manager Support & Operations	Australian Antarctic Division (AAD)	Australia	rob.wooding@aad.gov.au
Cheng	Xuyu	Engineer	Polar Research Institute of China (PRIC)	China	chengxuyu@Pric.org.cn
Supkyu	Yoon	Administrator	Korea Polar Research Institute (KOPRI)	Republic of Korea	skyoony@kopri.re.kr

Appendix 2: SAR Workshop IV Agenda & Schedule

Agenda

1. Opening, apologies, introductions
2. Background to the SAR Workshop IV and brief review of SAR Workshop III, and update on progress
3. Exchange of information/key messages from Rescue Coordination Centres
4. Exchange of information/key messages related to non-governmental operations, fisheries and all air activity:
 - a. Air operations in the Peninsula Region
 - b. Air activity in support of National Antarctic Program operations
 - c. IAATO and air activity in relation to tourism
 - d. National Antarctic Program Air Activity including Remotely Piloted Aircraft Systems (RPAS)
 - e. Fisheries activity
5. Exchange of information/key messages from National Antarctic Programs
6. COMNAP products and tools
 - a. e-AFIM
 - b. COMNAP Asset Tracking System (CATS)
 - c. Other tools in support of science, operations and logistics
7. Best practice and lessons learned during recent real Antarctic emergency events
8. Regional Mass Rescue Operation (MRO) Scenarios Workshop
 - a. Peninsula-aviation scenario
 - b. Ross Sea Region-traverse scenario
 - c. Dronning Maud Land/East Antarctica-marine scenario
9. Conclusions
10. Close

COMNAP SAR Workshop VI Schedule: Day 1 Wellington

Venue: (Buses will take delegates to) The Ricoh Sports Centre, 237 Taita Drive, Avalon, Lower Hutt

Day 1: Tuesday 14 May 2019 (09:00–19:00)

09:00	<i>For all delegates-bus transfer from city to SAR Workshop venue Bus departs from Te Papa–Museum of New Zealand Te Papa Tongarewa 55 Cable Street, Wellington</i>
09:45	Delegates arrive workshop venue, pick up name badges
10:00–11:00	<i>Session Chair: Greg Johnston</i> a) Opening, introductions and welcome Introduction from Mike Hill, Manager JRCCNZ Welcome from Michelle Rogan-Finnemore, COMNAP Executive Secretary Welcome from Keith Manch, Director Maritime New Zealand b) Safety, practical and technical challenges in the Ross Sea, Antarctica 10:30–10:50 Greg Johnston “The JRCCNZ Antarctic SAR Response Plan” 10:50–11:00 Initial questions, comments and discussion
11:00–11:30	Coffee break
11:30–12:30	Session continues 11:30–11:50 Luke Gaskin, New Zealand Ministry of Foreign Affairs and Trade, “Southern Ocean Overview” 11:50–12:10 Jack Fenaughty, New Zealand Industry Toothfish Committee, “A Commercial Fisheries Perspective” 12:10–12:30 Cathie McGregor, Maritime New Zealand, “IMO Polar Code”
12:30–13:30	Lunch
13:30–14:30	c) New Zealand capabilities and operational commitments to Antarctica 13:30–13:50 Ben Smith, Royal New Zealand Air Force 13:50–14:10 Murray Tuffin, Royal New Zealand Navy 14:10–14:30 Discussion
14:30–16:00	Tour of the JRCCNZ Operations Room and Maritime Operations Centre (two groups alternating with afternoon coffee break)
16:00	<i>For all delegates-Bus departs venue for return to Wellington city centre</i>
17:00–19:00	<i>For all delegates-Diplomatic reception hosted by New Zealand Ministry of Foreign Affairs & Trade</i>

COMNAP SAR Workshop IV Schedule: Days 2 and 3 Christchurch

Venue: Canterbury Employers' Chamber of Commerce, Mainland Room, 57 Kilmore Street, Christchurch Central (www.cecc.org.nz)

Day 2: Thursday 16 May 2019 (08:00–17:30)

08:00–09:00	Workshop registration
09:00–09:30	<p><i>Sessions 1 & 2 Chair: Michelle Finnemore</i></p> <p>(1) Opening, apologies, introductions Welcome from Dr Kelly K. Falkner, COMNAP Chair; Greg Johnston, JRCCNZ; and Simon Trotter, Antarctica New Zealand</p> <p>(2) Workshop background and review of progress</p>
09:30–11:00	<p><i>Session 3 Chair: Greg Johnston</i></p> <p>(3) Key Messages from Antarctic “gateway” RCCs</p> <p>09:30–09:45 Christian David Corona, Chief, Puerto Belgrano SAR RCC, Argentina 09:45–10:00 Lars Christiansen, Head Antarctic Affairs, Chilean Navy, Chile 10:00–10:15 Santiago Madrid, Advisor, Chilean Air Force, Chile 10:15–10:30 Chris Wilson, Senior SAR Officer, JRCCNZ, New Zealand 10:30–10:45 Louise Proctor, Manager Response Policy, ASMA Australia 10:45–11:00 Jared Blows, Chief, MRCC Cape Town, South Africa</p>
11:00–11:30	Coffee break
11:30–11:40	<i>Session 3 continues:</i> Further discussion and summary of key points from session 3
11:40–12:30	<p><i>Session 4 Chair: Kelly Falkner</i></p> <p>(4) Key Messages from fisheries and aviation sectors</p> <p>11:40–11:55 Bonney Webb, Fishery Monitoring & Compliance Manager, CCAMLR 11:55–12:10 David Rootes, ALE Logistics Manager, IAATO 12:10–12:25 Paul Sheppard, Chief Program Manager USAP & COMNAP Air Operations Expert Group Leader 12:25–12:30 Questions, comments, initial discussion</p>
12:30–14:00	Lunch break
14:00–15:30	<p><i>Session 5 Chair: Simon Trotter</i></p> <p>(5) Key Messages from National Antarctic Programs</p> <p>14:00–14:15 Vincenzo Cincotti, Director, ENEA, Italian National Antarctic Program 14:15–14:30 Wei Fuhai, Deputy Division Head of Expedition and Operation, Polar Research Institute of China 14:30–14:45 Chris Gallagher, Field Support & Emergency Management Co-ordinator, Australian Antarctic Division 14:45–15:00 Simon Garrod, Director of Operations, British Antarctic Survey 15:00–15:30 Discussion of sessions 3, 4 and 5</p>
15:30–16:00	Coffee break
16:00–17:00	<p><i>Session 6 Chair: Robb Clifton</i></p> <p>(6) COMNAP products & tools</p> <p>16:00–16:20 Update on COMNAP ATOM, CATS & the e-AFIM and annual information exchange requirements 16:20–16:45 <i>External guest speaker:</i> Wolfgang Rack, Associate Professor, University of Canterbury, “Sea Ice Remote Sensing Innovations: Technology on the <i>Aghulas II</i> 2019 Voyage” 16:45–17:00 Discussion</p>
17:00–17:30	<i>Session 8 Chair: Dave Wilson</i> Introduce Regional MRO Scenarios
18:30–20:30	Workshop Dinner

Day 3: Friday 17 May 2019 (08:30–16:00)	
08:30-08:40	<i>Summary of previous day / questions: Michelle Rogan-Finnemore</i>
08:40–9:15	<i>Session 7 Chair: Lars Christiansen</i> (7) Lessons learned from recent real events 8:40–8:50 Fire at Bahia Fildes (Chile) 8:50–9:00 Lessons learned from recent medavac in Peninsula (USA) 9:00–9:15 Discussion
9:15–12:30	<i>Session 8 Chair: Dave Wilson</i> (8) Regional MRO Scenarios Workshop (Break-out groups) Region: Peninsula, Co-Led by Lars Christiansen and Christian Corona Region: East Antarctica/Dronning Maud Land, Co-Led by Jared Blows, Cindy Francis and Andrew Burden Region: Ross Sea Region, Co-Led by Greg Johnston and Richard Hunter Includes reports back from each region and discussion
12:30–12:40	Close of formal part of workshop
12:40	<i>Buses depart Workshop venue for Antarctica New Zealand offices-where lunch will be provided and there will be a tour of the Antarctic-related facilities.</i>
13:00–14:00	Lunch break
14:00–16:00	Tour of the airport campus headquarters of Antarctica New Zealand, and the Christchurch offices of the Italian Antarctic Program, the Korean Antarctic Program and the US Antarctic Program.

Appendix 3: SAR Workshop IV Action items

All	
Refer to the COMNAP ATOM, e-AFIM and the SAR Website on a regular basis to ensure it is up-to-date with your information. Contact COMNAP Secretariat for any updates required.	
Pre-deployment check for registration of Personnel Locator Beacons (PLBs) (that you have awareness of) that are going to be used in the Antarctic Treaty area.	
The key workshop messages and the presentations should be shared with a wider group. The COMNAP, the International Association of Antarctica Tour Operators (IAATO), the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) and Antarctic Treaty Secretariats have a role to play in this, as do the RCCs and the COMNAP Member National Antarctic Programs.	
Sharing of post-incident review documents is recognised as a valuable learning tool and reports of lessons learned should be shared by way of the COMNAP Members' Only webpage. Other mechanisms to share such information should continually be explored.	
Explore further options for a system that would provide overall awareness of all assets (marine, land and air) in the Antarctic Treaty area.	
RCCs	
Share with other RCCs any relevant MOUs, protocols and policies.	
Populate the SAR Webpage with information.	
Refer to CCAMLR CM-10-04 that provides the framework for the operation of VMS data and provides for authorised use.	
National Antarctic Programs	
Consider common approaches to SAR response-related training or greater collaboration on training across programs.	
All National Antarctic Programs have access to ATOM by way of the COMNAP Members-only website and all National Antarctic Programs to share the ATOM with their Government Ministries.	
Consider the limitations (such as bandwidth) of the CATS and explore new technologies that may exist to address those limitations	
Others	
Governmental agencies and organisations in "Gateway Cities" are asked to consider that SAR coordination and response requires medical/hospital facilities and assistance originating from their areas. Therefore, those cities require assets and human capability to respond adequately to a SAR situation. Placement and maintenance of medical equipment in "gateway cities" is critical and requires continued investment by countries.	

<p>IAATO also recognises the need to share information including to remind RCCs of their members assets which might be called upon to assist in the event of a SAR incident. IAATO to further consideration of how best to share their information.</p>	
<p>For countries that have an agreed media protocol between their RCC and their National Antarctic Program, request these protocols are shared on the COMNAP SAR webpage.</p>	
<p>Recognising that the e-AFIM is a COMNAP product that is meant to include all information related to air operations in the Antarctic, commercial operators, especially those that are participating in remote activities for tourists and have developed their own infrastructure including runways are encouraged to ensure information in relation to their air infrastructure and air operations should be included in the e-AFIM.</p>	
<p>COMNAP AGM to consider including the Air Operations Planning Map Series into the e-AFIM; to consider including a focused discussion on fire prevention and response at an upcoming AGM; to review terminology in relation to SAR events, to medevac, and to medical transfer as part of an upcoming Safety Expert Group session.</p>	
<p>Through a COMNAP paper to the ATCM, recommend that competent authorities or those agencies that are permitting or authorising requests from air operators for Antarctic Treaty area activities consider the safety and SAR implications of the activity being proposed that are not likely being considered by the competent authority. Consideration should also be given as to whether the authorisation process can involve the RCCs and National Antarctic Programs and the COMNAP Secretariat or at the very least communicate the details of the proposed activities to the relevant RCC.</p>	
<p>For all those operating or contracting personned aircraft in the Antarctic Treaty area, consider using technologies such as Traffic Collision Avoidance System (TCAS) in all fixed wing and rotary aircraft in order to de-conflict airspace. There is currently no mandatory requirement for TCAS to be installed and turned on, although Traffic Information Broadcasts by Aircraft (TIBA) as recommended by ICAO Annex 11 is still recommended for use in ATCM XXXVI Resolution 1 (2013) and procedures are explained in e-AFIM Appendix 5. TCAS is a technology advancement on the TIBA system and does not require VHF transmissions.</p>	