COMNAP
Council of Managers
of National Antarctic Programs

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

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

Co-hosted by the Chilean Directorate General of the Maritime Territory and Merchant Marine (DIRECTEMAR) & the Instituto Antártico Chileno (INACH)

1 June (Wednesday) and 2 June (Thursday) 2016
MRCC Chile, Avenida Subida Cementerio 300, Playa Ancha
Valparaiso, Chile

Search and Rescue (SAR) Workshop III
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Introduction

The Council of Managers of Managers of National Antarctic Programs (COMNAP) considers safety of human life of primary concern in all Antarctic activities. In support of the goal to continually improve search and rescue (SAR) coordination and response in the Antarctic Treaty area, COMNAP convened SAR Workshop III in Valparaiso, Chile, in partnership with co-hosts the Chilean Directorate General of the Maritime and Merchant Marine (DIRECTEMAR) and Instituto Antártico Chilean (INACH). The SAR Workshop III was held on 1 and 2 June, 2016. As per Recommendation 4 (2013), the workshop invited representatives from all of the relevant Rescue Coordination Centres (RCCs), from National Antarctic Programs, relevant experts including from IAATO, CCAMLR and IMO, as well as commercial emergency notification service providers. The workshop was of a technical, practical and non-political nature held in the spirit of the Antarctic Treaty 1959. Fifty-seven people attended the workshop (see Appendix 1 for registrants list). All plenary sessions benefited from Spanish/English translation.

This is the report of key outcomes from the workshop. The agenda and schedule can be found as Appendix 2 and the list of action items can be found as Appendix 3 of this report.

At the conclusion of the workshop, acknowledging the request to COMNAP in ATCM Resolution 4 (2013) to hold SAR Workshops every three years, COMNAP welcomed a proposal from Maritime New Zealand and Antarctica New Zealand to organise the next COMNAP Antarctic SAR Workshop IV (2019) in New Zealand. Details will be confirmed closer to that time.

Objectives

The overarching objective of the workshop was to continue to **improve Search and Rescue coordination and response in the Antarctic** as a follow up on SAR Workshops I (2008, Viña del Mar/Valparaiso) and II (2009, Bueños Aires, Argentina).

Specific objectives of this third workshop are to:

- Conduct a **review of progress**, in particular on actions arising from the previous workshops;
- Continue **exchange of timely and useful information** that can be used in the event of a SAR situation;
- Review the COMNAP SAR webpage and enhance to meet its goals and purpose;
- Update all participants on the implementation of the IMO Polar Code;
- Discuss lessons learned from recent real SAR incidents;
- Carry out a “live” table top SAR exercise to increase response capabilities in the future.

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, ITU, and national laws and regulations in force.

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 which align with the workshop sessions, that is, by relevant agenda item.

Agenda Item 3
Key messages from Rescue Coordination Centres (RCCs)

General

- In an emergency that takes place in the Antarctic Treaty area (south of 60^{o} South latitude), it is usual that the response coordination point will be the RCC from the country that has coordination responsibility for that area of Antarctica. Therefore the RCC person or organisation coordinating the response is usually based outside of the Antarctic Treaty area.

- Each of the five RCCs which have responsibility for coordination and response over a portion of the Antarctic Treaty area, have responsibility over extremely large areas, including large sea or ocean areas.

- 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 impact the core business of that program, that is, what impact diversion of assets will have on science support, operations and logistics.

- Antarctic situations not only require RCC/National Antarctic Program coordination, but often cross-RCC collaboration and coordination is required. Such cross collaboration adds another dimension and complexity to the whole process.

- RCCs have other responsibilities in addition to SAR, such as marine pollution response.

- All five RCCs look north as well as south in their areas of responsibility.

- Consideration of the most recent real Antarctic events that RCCs have responded to, demonstrate the range and diverse nature of the situations that must be addressed and coordinated.

- Some “emergency” situations turn out to be “false alarms”. But, regardless, each activation must be responded to and investigated. Such responses divert resources, attention and efforts to the wrong purposes.

- It is recognised there are different types of Antarctic emergencies, those that are normally managed by the National Antarctic Programs and those that require assistance from the respective RCCs. This is consistent with normal SAR practice, where local units or coordinators are responsible for management of incidents within their capacity and seek assistance from National RCCs when required. One RCC uses a Category I and Category II system to determine the level of response

required. Category I is a situation which 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. This is national nomenclature for New Zealand's SAR system, but is not normal terminology used between SAR authorities outside of New Zealand.

- In some emergency cases, it is simply not possible to provide any assistance.

- Often, the timeliest response can come from a "ship of opportunity". But, such ships need capability in order to effectively assist.

- Some situations require aviation support which may come from National Antarctic Programs, military organisations, or contracted civilian aircraft, and such support may include reconnaissance, communication and equipment or supply drop.

- There are very limited and spread-out SAR assets actually available in the Antarctic Treaty area and the availability of assets changes across the different times of the year. For example, there are limited air/aviation capabilities available in the Antarctic Treaty area in the winter months.

- Bilateral agreements between organisations are important and are the basis for our collaborative approach to the Antarctic. It was suggested that the SAR arrangements between countries with Antarctic SAR responsibility could be further strengthened to include a specific schedule or a specific section to acknowledge and identify unique elements of the cooperation that are in existence for the Antarctic. In some cases regional agreements might also be useful but this was not seen by all as the best way forward for the Antarctic at this time.

- Where multi-organisations are involved, it is important to apply a very collaborative approach which plays to the strengths of each organisation.

Preparedness

- Preparation for an event is equally important as action during an event. Workshops, training and exercises are a key component of preparation.

- Pre-trip planning by those going to the Antarctic Treaty area for any reason can reduce the need for a response or at least improve readiness and remove or reduce the "search" stage.

- SAR coordination and response requires medical/hospital facilities and assistance originating from non-Antarctic areas, such as the "gateway cities". Therefore, those cities require assets and human capability in order to adequately respond to a SAR situation. Acquiring and maintaining such assets are usually outside of the control of the RCC or the National Antarctic Program organisations. Placement of critical equipment, such as hyperbaric chambers, in "gateway cities" is critical.

- Availability of, training with, and use of new technologies, such as e-health capabilities, at Antarctic stations, coupled with required bandwidth capacity is necessary.

- Regular training and exercises are important with lessons learned from such exercises important to share with others.

- For some of the RCCs, the “Antarctic expertise” is outside of that RCC, meaning it resides in an Antarctic organisation, like a National Antarctic Program. So a Memorandum of Understanding (MOU) is important for each organisation involved in order to understand roles and responsibilities in the event of an emergency.

- Ability to talk with the right person/people at the needed time often makes the difference. So accurate information, provided in advance, is important and is the responsibility of all involved to ensure information is kept current.

Communications

- In an age where information spreads quickly, there is a need for a communications plan or a crisis management communications plan. It can also be challenging to communicate with one country’s layers of governmental branches, so communications plans should be outward and inward looking. Communications pre-event as well as during an event are equally important.

- During a SAR event, a common, consistent, correct message from all organisations involved is important. Integrity and timeliness of the message is critical.

- Some National Antarctic Programs are geographically remote from the Antarctic area and so rely on those close to the situation to communicate the situation to them. In some cases, RCCs may communicate to the other government involved. Such communication is important and should be handled in the appropriate manner.

Agenda item 4
Key messages from invited experts

- The new MEOSAR medium-altitude earth orbiting satellite system will provide early operational alerts to RCCs as soon as the July/August 2016 timeframe. The MEOSAR system has embarked SAR transponders on global navigation satellites which will be compatible with the current generation of Cospas-Sarsat beacons. Early use of the MEOSAR data indicates MEOSAR offered a time-advantage of several hours in detection of the distress beacon over current systems.

- MEOSAR requires MEOLUTS (MEOSAR ground stations). Some of the Antarctic gateway countries (Argentina, Australia and New Zealand) have implemented the MEOLUTs while others (Chile and South Africa) have announced planned systems. The Cospas-Sarsat representative strongly encouraged States operating MEOSAR ground segments covering the Antarctic to coordinate their MEOLUT's tracking schedules, to ensure optimal and complete satellite coverage of the Antarctic area.

- RCCs should prepare to use this new MEOSAR data source and should familiarize their operators with the new RCC Handbook, which will include MEOSAR and will be available on the Cospas-Sarsat website in January 2017.

- Part I of the IMO Polar Code is related to Safety and applies to SOLAS vessels (so fishing vessels, for example, are excluded). Section A contains mandatory requirements while Part B contains guidelines. A Polar Water Certificate is required for vessels that plan on operating in such waters. The Certificate will only be issued to those vessels which have a Polar Water Operations Manual (PWOM) which is based on assessment.

- Operators must undertake an assessment that takes into account their vessel, its capabilities and the anticipated conditions they will encounter. On this basis they set limitations on where and when they will be able to operate and what, if any, additional equipment they need to carry. In addition to the anticipated conditions, and other factors, operators must take into account places of refuge and operation from areas remote from SAR capabilities.

- Recognising that CCAMLR Vessel Monitoring System (VMS) data could serve as an additional resource to support maritime SAR involving a fishing vessel, at its meeting in 2013, CCAMLR-SCIC considered the possible use of this VMS data to support SAR efforts in the CAMLR Convention Area. Subsequently, representatives from the five MRCCs worked with their CCAMLR Commissioners and the CCAMLR Secretariat to draft an Arrangement to provide for the secure release of CCAMLR VMS data to support SAR in the CAMLR Convention Area. Following the testing of VMS data requests with three MRCCs, the Secretariat developed and implemented an automated process for the timely release of VMS data to support a SAR response consistent with the provisions of the Arrangement. The automated process which is now available to all MRCCs means that the release of relevant CCAMLR VMS data is instantaneous.

Agenda item 5
Key Messages from National Antarctic Programs
General

- National legislation must be followed and therefore this feeds into Antarctic operations.

- National Antarctic Program schedules are changing. For example, some National Antarctic Programs are moving from summer-only into year-round Antarctic operations. National Antarctic Program operations are changing. For example, from near-station operations and science support to remote field locations. National Antarctic Programs are moving into different topography. For example, many science programs are asking for support to operate on ice shelfs, on sea ice, and under ice of all types.

- 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.

- Most emergency situations take a long time to play-out and evolve through a range of stages from start to resolution.

- There are different understandings of risk. But, certainly, risk increases when “at

the extreme" is seen as "normal" or "doable".

- While most SAR situations focus on the marine and coastal Antarctic environments, inland Antarctic stations are called on to render medical assistance also. For example, to treat altitude-related sickness and for medical evacuation back from the South Pole area.

- Some relatively small Antarctic stations may be no better equipped to handle a medical emergency than a ship is.

- Extending seasons and air capabilities, extends risk as well as providing new opportunities.

- Terrestrial situations are often as challenging to respond to as those in the marine environment. Opening of new runways can be seen as an opportunity to improve response, but also will bring with it increased risk of an incident.

- COMNAP should continually improve ways to share lessons learned, not just with tools and systems such as the Accident, Incident and Near-Miss Reporting (AINMR) system but also through its Annual General Meetings and the Ship and Air Operations Expert Groups.

- Interagency relationships require on-going development.

Preparedness

- Reactivity and proactivity are very different things. Creation of a safe environment and providing ways to help those in an emergency situation, should one arise, is an important aspect of Antarctic work.

- There is a real benefit in training and being prepared to respond.

- Development of technologies should consider any technology application to SAR situations. A good example is UAS and its usefulness in SAR operations.

- Assets must already be purchased and in place in order to be useful in most emergency situations. So National Antarctic Programs must build capacity even if such resources just sit in place waiting for long periods of time. This is a difficult thing to defend, especially in times of reducing National Antarctic Program budgets.

Communications

- While those involved in National Antarctic Programs have a good understanding of Antarctic-specific challenges (darkness, distances, weather, etc), many non-Antarctic people should be reminded or educated on the specific Antarctic challenges and difficulties an emergency situation presents.

- National Antarctic Programs have lost the ability to "control the message". Meaning that national Antarctic programs along with other organisations, now recognise the need to deal with modern worldwide communications, that is, information may go

quickly outside of an organisation and be sent around the world in a very short time and with little effort, without the control and clarity that some situations may require.

- Lessons learned, should be lessons shared and there is a role for the COMNAP AINMR system for this. Currently the system seems to be underutilised.

- Even with a communications plan, in today's world, every person is a journalist. While most strongly discourage "closing down" lines of communications during a crisis, there needs to be in place, before any crisis, a communications plan which has been explained to anyone that is involved.

Human resources

- Years spent building relationships is never time wasted.

- In an emergency situation, people are called from their day-to-day business to emergency incident mode. There are different personal skills required in each situation. Some people step-up easily to the challenge and others are not able to do so. Also, day-to-day business must still be maintained. Emergency situations have a real impact on organisations.

- Leadership development is as critical as having other types of training.

- Leadership development and "experience reliability" are key aspects of maintaining good staff that can step-up to the situation in an emergency. The Antarctic Roadmap Challenges (ARC) project, which identified human capacity/human resources as a challenge has yet to address this identified challenge of human resource development but should do so in the near future.

Agenda items 6 and 7
COMNAP products and tools & the role of new technologies in SAR situations

- COMNAP is an organisation which can assist when a collective response is required. Identifying what those situations are and what we can do in response is important. Developing resources, products and tools, to assist requires consideration.

- Collective problems include coordination and resourcing for land-based SAR emergencies and responses, training in support of prevention of an incident, regional or Antarctic-wide coordination, sharing of best practice, lessons learned and annual pre-season information, and interoperability of equipment, language and processes.

- The COMNAP Secretariat, webpages and the Annual General Meeting can assist with these collective solutions if National Antarctic Programs come prepared with the information to exchange. 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.

- There is a role for new and emerging technologies also. Not only are UAS proving

to be useful in SAR situations, but also satellite systems and distress beacons. However, especially in the case of deploying UAV in SAR situations, care must be taken so that such new technologies do not interfere with other aircraft and create an emergency situation of their own.

- The COMNAP Ship Position Reporting System (SPRS) is currently under review. It is intended as a science support tool, but is also used by RCCs to determine ship positions which are useful in SAR situations. Any new system would have to be easy to use, reliable and inexpensive. Also, the COMNAP Infrastructure Catalogue project (Currently under development) may assist in understanding Antarctic facilities which can be utilised in a SAR situation.

- Any information on "available" resources must be dynamic, since the placement and availability of resources in the Antarctic change. For example, aircraft move all the time. Points of contact for each National Antarctic Program and good contact information and networks may be the best asset in an emergency situation since those points of contact know where their resources are at any given time.

- The COMNAP SAR website is a good resource for contact information. National Antarctic Programs and RCCs must ensure they inform the COMNAP Secretariat of any updates required.

- The COMNAP Antarctic Telecommunication Operators Manual (ATOM) is also 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 too should be regularly reviewed by all those information is included within it 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.

Agenda item 8
Lessons learned from recent real events
Real Event 1: Catastrophic controlled flight into terrain (helicopter crash)
Key lessons learned:

- Having SAR response within 1 hour was critical to survival of those injured.
- Follow-on response also critical.
- Survival gear on-board the aircraft involved in the accident was critical.
- The need for a patient transfer stretcher system to fit all aircraft involved in the evacuation chain was recognised as a lesson learned from this event - since each movement of the patient to a different stretcher greatly reduces the likelihood of patient survival.
- Most Emergency Locator Transmitters (ELTs) activate in the event of an impact/accident, but the real question that should be considered is, when the device activates, can it be detected? Placement of the device in the aircraft is critical.
- Post-incident psychological effects may be very bad on those that were involved, not only in the accident, but in the rescue activities. The psychological effect may even spread wider than those involved in the accident and rescue, and go beyond the organisation itself.

Real Event 2: Activation of a DeLorme InReach Satellite Emergency Notification Device (SEND) in Southern Ocean which was a false alarm.
Key lessons learned:

- All activations require a response, even if they turn out to be a “false alarm”, since this is not known in the first instance.
- Use of emergency location devices for activities other than location and response in SAR situations is strongly discouraged. For example, in this situation, the distress beacon was being used by a scientist to collect iceberg movement data.

Real Event 3: VID Activation of a distress beacon with an identification number beginning with “535” of a spot device in Southern Ocean which was a false alarm.
Key lessons learned:

- Spot devices are tools that must be used properly. In this case proper registration of the device would have assisted.
- Also, letting the relevant RCC know pre-deployment of your intentions and letting them know you are using spot devices and for what purpose is always helpful to the RCC.
- Some of the RCCs have MOUs with device organisations. For example, RCC New Zealand has an MOU with GEOS.
- Personal Locator Beacons (PLBs) are becoming more and more common to use. They must be registered properly and used appropriately in order to be effective.

Agenda item 9
Regional Discussions
Peninsula
The topics of media/communications, the maritime surface picture, language barriers and position reporting systems were presented and were seen as being important.

Dronning Maud Land/East Antarctic
There are certainly cross-regional issues that should be considered on a regular basis. Recognising this, the two regions agreed to meet at the COMNAP AGMs before their regional break-out groups to discuss any cross-regional issues.

Ross Sea
There are particular challenges related to winter SAR situations. Pre-deployment training is a key to reducing winter-over risk. The group agreed to share information on pre-season training including pilot training, flight schedules and aircraft suitability for winter deployment.

Agenda item 10
Live Tabletop Exercise
Fishing vessel in Southern Ocean with fire on-board resulting in injury to 3 pax
The holding of regular exercises such as these is useful for the MRCC involved and the vessels that agree to participate. It was hoped that a range of different vessels and operators would be approached to participate in future exercises.

Appendix 1: SAR Workshop III Registration List

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Appendix 2: SAR Workshop III Agenda & Schedule

Agenda

1. Opening, apologies, introductions
2. Background to the SAR Workshop III and brief review of SAR Workshop I and II and ATCM Special Working Group on SAR outcomes and review of progress
3. Exchange of information/key messages from all five Rescue Coordination Centres
4. Exchange of information/key messages from invited experts
    a. Medium-altitude Earth Orbit Search and Rescue (MEOSAR) System
    b. IMO Polar Code
5. National Antarctic Program perspectives/key messages
6. COMNAP products and tools
    a. SAR Webpage
    b. Antarctic Telecommunications Operators Manual (ATOM)/Facilities List
    c. Antarctic Flight Information Manual (AFIM)
7. New technologies/Innovative tools in support of SAR situations
8. Regional Discussions
9. Discussion on lessons learned during recent real events
10. “Live” tabletop SAR exercise
11. Conclusions
12. Adoption of Workshop Report
13. Close

Schedule: ***COMNAP SAR Workshop III Day 1: Wednesday 1 June 2016***	
Day 1: Wednesday 1 June	
08:30–09:00	Workshop registration and workshop group photo
09:00–09:30	*Session Chair: Michelle Finnemore* (1) Opening, apologies, introductions Welcomes from: Professor Kazuyuki Shiraishi, COMNAP Chairman; Vice Admiral Osvaldo Schwarzenberg, DIRECTEMAR Director General of Maritime Territory and Merchant Marine; and Dr. José Retamales, INACH Director (2) Background and review of progress
09:30–11:00	*Session Chair: Carlos Salgado* (3) Key Messages from the five RCCs Presentations from: 0930-0945 Health facilities' capacity in the city of Ushuaia in the event of an SAR situation *Marcelo Saenz Hintze, MRCC Argentina* 0945-1000 How the SAR MOU between the AMSA & AAD work in the Australian SRR including understanding coordinating arrangements *Christine MacMillian, Australian Maritime Safety Authority* 1000-1015 Responsible Antarctic activity & international cooperation in SAR operations *José Luis Sepúlveda Mancilla, MRCC Chile* 1015-1030 SAR coordination in the Ross Sea Region *David Wilson, RCC New Zealand* 1030-1045 MRCC Cape Town SASAR/SAR Southern Ocean region & Antarctica *Jared Blows, MRCC Cape Town* 1045-1100 Initial Questions/comments
11:00–11:30	Coffee break
11:30–12:00	(Continued) Discussion of agenda item 3
12:00–13:00	*Session Chair: José Retamales* (4) Key Messages from invited experts 12:00-12:20 Medium-altitude Earth Orbit Search and Rescue (MEOSAR) System *Cheryl Bertoia, Deputy Head/Principal Operations Officer Cospas-Sarsat Secretariat* 12:20-12:40 IMO Polar Code Update – Safety and Emergency Response provisions *Kim Crosbie, Executive Director, IAATO* 12:40-13:00 Discussion
13:00–14:30	Lunch break
14:30–16:30	*Session Chair: Simon Trotter* (5) Key Messages from national Antarctic programs Presentations from: 1430-1445 Working towards best practice methods in Search and Rescue *Simon Trotter, Antarctica New Zealand* 1445-1500 New and modernized air & marine capacity to enhance SAR situations *Marcelo Saenz Hintze, MRCC Argentina & Veronica Vlasich, Direccion National del Antartico* 1500-1515 Considerations for a Winter Medical Evacuation *Tim Stockings, British Antarctic Survey* 1515-1530 United States Antarctic Program SAR capabilities *Paul Sheppard, US Antarctic Program* 1530-1630 Discussion
16:30–17:00	Coffee break
17:00–18:30	*Session Chair: Rob Wooding* (6) COMNAP products & tools; (7) New technologies

Day 2: Thursday 2 June	
08:30–9:30	*Session Chair: José Retamales* (8) Discussion of lessons learned from recent real events
9:30–11:00	*Session Chair: Jonas Mphepya* (9) Regional discussions Region: Peninsula, Led by Ricardo Velasquez Region: East Antarctica/Dronning Maud Land, Led by Robb Clifton Region: Ross Sea, Led by Peter Beggs
11:00–11:30	Coffee break
11:30–close	Session Chair: *José Luis Sepúlveda* (10)“Live” tabletop exercise
13:00–14:30	Lunch
14:30–16:00	Tour of MRCC Chile (Optional)

Appendix 3: SAR Workshop III Action items

All	
Refer to the COMNAP ATOM 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. The Antarctic Treaty Secretariat EIES should also be regularly reviewed to ensure information is current.	Ongoing
Encourage your governments and relevant agencies in States operating MEOSAR ground segments covering the Antarctic to coordinate their MEOLUT's tracking schedules, to ensure optimal and complete satellite coverage of the Antarctic area.	ASAP
RCCs	
Share with other RCCs any relevant MOUs.	Ongoing
MRCCNZ to share information on its definitions and choice of responses involved in Category I and Category II events with other RCCs and National Antarctic Programs through the COMNAP Secretariat.	ASAP
National Antarctic Programs	
Make an effort to refer to, and populate the AINMR system in order to be well-placed for a focussed discussion on the system at the COMNAP AGM 2016.	Now through August 2016
Those active in the Ross Sea Region to share information on pre-season training; including pilot training, flight schedules and aircraft suitability for winter deployment for discussion at the COMNAP AGM.	Now through August 2016
All national Antarctic programs are encouraged to send their advance season information, including SAR points of contact, to the COMNAP Executive Secretary as soon as possible for sharing/exchange of information.	ASAP (each season)
Others	
COMNAP Secretariat to share the RCC information in the ATOM with the Antarctic Treaty Secretariat.	ASAP
CCAMLR to share through the COMNAP Secretariat the template arrangement for the sharing of CCAMLR VMS data for the purposes of SAR.	ASAP
COMNAP AGM to have focused discussion time in regards to the AINMR system in order to improve population of the system.	August 2016
IAATO to share through the COMNAP Secretariat their Communications Plan.	ASAP