Avalanche SAREX for Wanaka /Queenstown
19 June 2012

Analyse SAREX Need

completed √

1:	Establish SAREX Planning team (See Appendix A for instructions and Appendix C and D for Examples)		√
	Police - SAR Coordinator	Aaron Nicholson	
	Mountain Safety Council	Gordon Smith	

2: Identify trends and predictions, response needs and asset assessment (See Appendix B) √

Trends and predictions

- Following on from Avalanche activity that resulted deaths in Queenstown and Methven 2011 Wanaka Police have looked at our local risks with the many and varied recreational and commercial skiing activities in our area considered it necessary to test our SAR pre plan.
- Our Pre plan has been developed over the past 3 years. The elements and resources involved in the pre plan have trained independently within the auspicious of their own groups.
- The Police SAR Pre Plan has never been tested in full and in real time to see if and how all the elements would gel.

Response Needs

- A general test of the Pre Plan has been considered and funds sought to facilitate this test.
- This will involve a scenario base avalanche response in day light hours for a heli ski group caught in a significant avalanche.

Asset Assessment

- Avo Pre Plan exists with resource list attached for sourcing appropriate response groups for the type of incident.
- Helo support from the nearest and closest commercial operator would be sought from either Queenstown or Wanaka.
- NVG capability machine is available in Te Anau and Dunedin if required.
- Comms plan is detailed in the Avo Pre Plan.

3 Summarise need: √

It is recognised that with the high number of ski fields, heli ski operators and back country touring interest there is a high risk of Avalanche activity in our area.

It is acknowledge that avalanche activity occurs more than reported and self party rescue activity resolves a number of these occurrences.

This reinforces the need for a robust and efficient Avalanche Pre Plan that can be initiated quickly to respond to a time critical incident in an alpine environment.

4: Specify the purpose of this SAREX: √

- To review and test the existing Wanaka SAR Avo Pre Plan in real time to identify any deficiencies or improvements that can be made to enhance the survival chances of the victims.

5:	Determine specific SAREX objectives:		√
	• Test the Wanaka Avalanche Preplan for process and timings.		
	• Identify any training or operational issues with larger scale site management practices with multi agencies.		
	• Arrange non participating staff to be on site to maximise learning opportunities and outcomes.		
6:	Select exercise name	Wanaka Avo SAREX 2012	√
7:	Establish a budget	[redacted]	√
8:	Obtain lead agency authority	Police authorised	√
9:	Seek multi agency participation	Emails sent to key agencies plus phone calls • Police SAR • St John • MSC • Otago Polytechnic Avalanche programme Manager • Tai Poutini Polytechnic Avalanche Instructor • Heli ski guides from Wanaka/Queenstown • 2 Ski filed Ski patrollers (2 other unable to attend due to weather) • LandSAR Avo dogs • LandSAR ACR team • NZMGA Mountain guides • Aspiring Helicopters • Heli Otago (involved in Time lines for Advanced Life Support but not called to respond in real time	√

10:	Set Key Performance Indicators (KPI's)
	• IMT to work through the Pre Plan for deployment of resources in a timely manner with confirmed Comms plan established.
	• Avalanche Site Commander appointed by IMT with in first response team on site.
	• Injured patients are located in with appropriate medical intervention on site.
	• Rescuer safety considerations made by IMT and ASC

Develop exercise scenario

Initial planning was for a Heli Ski operation but due to weather issues the scenario had to be changed to a closer in field ski resort avalanche response.

Location:

Due to weather and snow conditions the exercise will be conducted on the Treble Cone Ski field in the Saddle area utilising previously controlled old avalanche debris.

A suitable area has been identified and will be prepared on the morning of the exercise. The area provides suitable safety and personnel exit strategies given the current poor weather conditions.

There is sufficient area for non participants to observe without interference with the exercise.

Scenario:

A group of 7 people head out ski touring from the Treble Cone car park, the ski filed is closed but this crew is keen to do some skiing before the field opens in a week.

There eventually get to the Summit Rocks on TC and decide to ski a line back down towards the main ski filed before skinning back up and going over the back of TC.

On their first descent the entire party gets caught in an avalanche. There are inexperienced and believe that if they are near the ski filed they will be ok.

Fortunately another Touring party observes the Avalanche and reports that to the local police via cell phone.

Only one Avalanche victim will be recovered conscious and alert and will supply all the information relevant to the incident that subsequent decisions will be formed and assessments made from.

Action:

A real time deployment and response will then take place through Police as a SAR operation via its Pre plan.

Witness report:

Jef Desbecker is out ski touring alone near the back of Treble Cone Ski field. He observes a group of 4-5 people ski touring off in the distance. He does not take much notice of them and carries on with his trip. He last saw them gathered together at the

top of a potential ski run near the summit rocks.

About 5 mins later he hears a bit of a thump and some brief yelling then turns back towards the party and sees a class 2 avalanche moving down the eastern face the group was previously on.

When the Avalanche comes to a stop he can see skis and poles on site but no movement. He marks his position on his GPS which is about 400 metres away from the Avalanche site and calls the local Wanaka Police station to report the avalanche.

His Report:
Details as above to who ever answers
Give personal details as known to you
Location as given by GPS and physical location on TC.
You can't add more than is stated above.
Note instructions given to you by Police.

Get your self into a position to ski into the middle of the debris and put your pack and skis at the edge. Leave a transceiver on send in the pack. Grab you pole and shovel and run around the site spot probing doing you own thing. If instructed to do or help with some thing, comply with all instructions given by the rescue team.

Leave your personal Transceiver on until someone you tells you to turn it off.

12:	Evaluate plan against training need Plan covers a range of levels of difficulty and management and exercises SAR response to meet a variety of needs on the ground. A full scale Avo SAREX with real time patients will be utilised.	√
13:	Determine exercise controllers, participants and resources required including RNZAF request for helicopter support: **Safety / Evaluation:** [redacted] - MSC will: • Act as Safety Officer on site in terms of managing Helicopter, observers, rescuers risks. • Evaluate the exercise, debrief on site if appropriate and record the learning outcomes. [redacted] - Otago Polytechnic Avalanche Program Manager • Evaluation and debriefing of exercise. [redacted] - Aspiring Dogs /LSAR will: • Be responsible for the safety of the two live burial victims. • Evaluate the performance of the dog teams. [redacted] - Police SAR Coordinator will • Monitor the exercise from a command and control perspective. • Adjust scenario to suit weather and circumstances. • Bring Radio Comms, PLB and Sat Phone to site. [redacted] - St John will • be site medic for any real time incident • be involved in the scenario as the Advanced Life Support function	√

[redacted] - Queenstown Police SAR
- Evaluate IMT functions at Wanaka base

14:	Confirm and announce exercise date/time and location 19 June 2012 imitated anytime after 10am on Treble Cone Ski field	√
15:	Develop detailed events **Scene:** The site will accommodate 7 burials: 3 x transceivers 2 x live burials - for dogs 2 x probe only finds	√
16:	Develop exercise safety plan: • A Site safety officer is appointed. • Comms are to be established and confirmed before any team is deployed in the filed. • Secondary Comms protocol with also be established. • All teams will have fist aid kits and appropriate safety equipment. • Activity will be monitored by independent Exercise monitors for safety concerns.	√
17:	Develop exercise 'control rules' "No Duff" applies.	√
18:	Appoint exercise monitors (local and external) and define their role	√
	See 13: above	
19:	Confirm multi agency participation See 9: above	√
20:	Set up SAREX	√

Conduct

		completed √
21:	SAREX's are run under CIMS, IAMSAR, or other recognized structure. CIMS selected as it is a Police / LandSAR SAREX	√
22:	Monitoring systems/real time feedback process in place Monitors to have established check sheets and Comms to monitor all SAR activity and record accordingly. SAREX will involve real time Comms.	√
23:	Start the exercise Unannounced Avo report from witness to Police to initiate exercise. Exercise then to continue until victims on site located and evacuation action started. .	√
24:	Sustain and control exercise activity Controlled by the Sgt Nicholson and Gordon Smith	√

25:	Intervention (if required) to keep exercise on track As above but to let the exercise take its natural course as it should be guided by the Pre Plan principals.	√

Debrief

		completed √
26:	Hot debrief immediately after SAREX	
	• Includes all personnel/agencies, written or verbal	√
	• Preliminary feedback from monitors	√
	• Provide appropriate exercise closure	√
27:	Cold Debrief within appropriate time frame: to be carried out at the next monthly LSAR meeting	
	• Key performance indicators are evaluated	
	• Internal review and analysis of SAREX systems, performance and processes	
28:	Monitors analysis and findings completed • See attached reports	√
29:	SAREX report completed • As attached	√
30:	Final report circulated to participants and agencies • Debrief notes etc to be circulated	√

Implement Learning

		completed √
31:	Implement report findings into Pre-plans, SOP's and training and development: • Amend Pre Plan as necessary to improve response performance.	√
32:	Ongoing evaluation	√
33:	Develop 'lessons learned' and distribute as appropriate • Forwarded to NZSAR	√

SOUTHERN LAKES AVALANCHE EXERCISE 19 JUNE 2012

Over the past year were have consolidated our Avalanche Pre Plan, which includes a Wanaka and Queenstown response (with input from most of the end users). Individual groups and teams within the industry continue to train in respect of the skills that meet the needs of their specific operation.

It was considered prudent to test the SAR Pre Plan in real time and in so bringing all the various groups and agencies together. (Pre plan attached)

NZSAR in Wellington favoring multi agency cooperation and the aim of a "One SAR Body" approach contributed funds to make this exercise happen.

Planning for this occurred in early June when Wanaka Police organised the annual Ski Industry Meeting which was held again in Cardrona. Industry representatives from Queenstown and Wanaka attended and contributed to the meeting along with an Avo related presentation from Gordon Smith MSC.

The current Pre Plan was ratified at that meeting and a date set to test that pre plan in real time. To facilitate the exercise the heads of the various agencies had a rough overview of when the exercise was to take place and what was we were trying to achieve. The concept was met with real enthusiasm as we had not previously got all the different likely response personnel together on the same day for such and exercise.

Three simple objectives for this exercise were established:

1. Test the Wanaka Avalanche Pre-Plan for process and timing.
2. Identify any training or operational issues with larger scale site management practices with multi agencies.
3. Arrange non-participating staff to be on-site to maximise learning opportunities and outcomes.

The scenario for the exercise was based around a Heli Ski team being significantly affected by an avalanche, requiring a full scale SAR response. This was to occur in a backcountry location. However due to weather and snow conditions the exercise had to be changed and the best case scenario for a 7 persons ski touring party being avalanched on Treble Cone while trying to access the back country was initiated instead.

During the exercise the Queenstown Ski Field and Heli Ski response could not be tasked due to the inversion layer that prevented flying. Having said that, although not ideal for full involvement for all sectors, this could be a reality due to weather or many other circumstances that prevent or limit some teams responding as per the plan.

It is anticipated that comments from our AVO SAREX and the others around the country, this and last year will be collated by one agency and all lesson and learning points collated so SAR Coordinators can input the relevant aspects into their respective Pre Plans and industry operators can refine their own Avo responses.

Below are comments from various observers and evaluators for this exercise. I have tried to keep comments connected under the same headings for easier reference.

The comments made are neither personal or pointed they are comments that provide an opportunity to reflect on action taken and if we can learn something or consider a different perspective then clearly we are all better off for the experience. All names have been removed from the debrief notes.

I would like to thank the Evaluation Team for their time and effort in helping make this process worthwhile.

Aaron Nicholson
SAR Coordinator
Wanaka Police

DEBREIF NOTES SUMMARY

Gordon Smith NZMSC Avalanche Programme • Avo response Evaluation • Overall site safety	**Peter Bilous Otago Polytechnic Avalanche Programme Manager & NZMGA Ski Guide:** • Avo response Evaluation	**Sergeant Aaron Nicholson Police SAR Coordinator:** • Exercise Overview • Command and Control evaluation	**Matt Gunn LSAR Dog Coordinator:** • Search dog response evaluation	**Snr Constable Julian Cahill Queenstown Police SAR** • IMT evaluation	**One Participants Observations: Heli Ski Guide**
		General Comment			
Weather conditions were not favorable to run this event on either of the 2 days set aside. Pre event there was a slow start to the winter, and snow on the ground to simulate avalanche conditions was scarce. Thanks to Treble Cone for allowing us to use their Summit slopes which had some of the only real debris in the region, albeit a modest size to run an ideal large scaled rescue scenario		This was the fist opportunity to test out Pre plan in real time. Although some aspects of the response were contrived, it still met its purpose indicating the timing and nature of coordinating the various response resources. It should be born in mind that the exercise was not to test individual skill sets as this was one of the positive by products of the exercise, but it was to run through our written plan step by step and see how the agencies would and could be coordinated.	SAR Dogs related feedback:	Having been asked to sit in and observe the Incident Management Team during Wanaka's simulated Avalanche Exercise, I travelled to Wanaka from Queenstown on Tuesday the 26th June 2012. I arrived in Wänaka at about 9.30 am. but due to thick low cloud the exercise was delayed until later in the day. During the exercise I took hand written notes	Here are some comments after the SAR training day. It is not meant as criticism on anybody in particular, but more question rising as the nature and equipment used to aid avalanche survival changes with time and improved systems. I'd like to hear others comments to my ideas and suggestions and create a discussion

				which are available to be typed up if required. They contain observations and times from what I heard in the IMT and on the radio.	
Objective One		**Test the Wanaka Avalanche Pre-Plan for process and timing.**			
Due to the low inversion cloud on the day of the event, the timing of crews arriving was really only tested for the Wanaka based teams, as all air traffic into Queenstown was grounded. I believe the exercise successfully tested the Avalanche pre plan system, and that it stood up to the test. Additions that should be considered, and brought into the pre plan are: • The need to source advanced medical personnel and equipment other than Dunedin based Rescue Helicopter service. This could be; suitable Ski Area Doctors, and needs more consultative work with the ski areas if they would be happy to release this resource; local paramedics with alpine/avalanche skills. • Using more of one ski field/s patrol to expedite the first teams response,	**Process**-Pre-plan was a good mix of professionals skilled at safety management, and implementing effective search techniques. Rescue aspect id'ed patient care as an area needing greater resources and better practices – outlined below in next section. **Timing-** It took relatively very little time(30 min) to get the closest resources (ski patrol) to initiate on site SAR, it took a significantly greater amount of time before ANY further resources arrived – which really stretched the initial response team – lots of victims located, but little additional help to dig out and treat them. 30 min. is still a long time to begin searching for a buried person to hope to find them alive (estimating approx. 25% for NZ) – this is more of a public awareness issue regarding the necessity of training and practice u8sing good decision making.	I became clear in the early stages of our exercise planning that the Pre plan need amendment to involve ALS Advance Life Support earlier into the response timeline than our call to ICU via the BK in Dunedin. G[redacted] comments on this in this review and work needs to be done of this. In terms of the process and resources sought by way of priority the Plan is fit for purpose. The Pre Plan is written up for a generic, all resources needed type response as it has to be, so we don't have 11 plans for all the various potential circumstances we could respond to. There is complete flexibility to respond to specific needs / request that comes from the field, i.e. Dogs only, 5 man Probe team etc etc. Users need to understand that	Scenarios will always be a challenge to set in such a way as to not have the dog find all targets, including transceiver (tx) and probe targets Possible solutions include: • When possible, bury the probe targets at least 24hrs prior to the exercise. • Excavate the tx target holes well in advance. These steps will minimize the surface sent but will not ensure that the dogs do not strike on them. The two dog teams that attended showed they had all the personal skills required and preformed to the highest standard. The site was naturally divided into four search areas aiding in a systematic search plan and the teams exploited the steady light wind. All dog target were found in	Prior to the start of the exercise I spoke with (Incident Controller) and (Operations Manager) regarding Pre Plan. They provided me with a copy which I read. The Pre Plan is an excellent document and provides the I/C with everything that he/she needs to respond to an Avalanche Incident. The exercise began at 1252 hours with an emergency call which was taken. During the call I ticked off required information as it was gathered. The call ended at 1256 and there nothing that not been asked for. The Ops Manager began making calls to get Teams mobilised and this was done efficiently and in a logical order. During the first 10 to 15	

then backfilling that patrol from another mountain's. This will need more consultation, and will likely depend on the circumstance a ski field finds itself in on any given day. • Known members of the local public who are Avalanche skilled and equipped who could be already at an adjacent ski field. Ski Patrol could help to source and vet these folks. It would cut down on flying time delays when shuttling professional crews from farther away.(really thinking about the Treble Cone example) Other considerations for the Pre Plan: What formal plan from the IMT does the first team get briefed with prior to flying to site? (Think how other SAR teams get deployed). If we are sending teams into the field to what is likely an unsecured site, or one where the details are yet to be confirmed, we should know what they are turning up with.	Due to the length of time (almost 1 hr) it take to get even 2nd heli load resources on site, and the chances of live buried victims hovering around 20% at this stage, we may consider diverting greater rescue effort and priority on any survivors to ensure they do not succumb to injuries due to incident and/or those from further exposure (hypothermia).	if SAR resources are requested then the incident falls under the control of police as the Incident Controller in which we use the CIMS model as per a standard SAR operation. This also means that Police are responsible for the cost of the operation. **Timings:** Due to weather issues we could not get the Queenstown responses off the ground. Had this occurred we would have had less lag between 1st and 2nd responses as the IMT (incident Management Team) will be trying to deploy resources concurrently. However this weather issues could be our reality on any given Sunday so it was good to acknowledge that the 1st response team could be the only response team.	good time. Dog teams must consider how much time has lapsed prior to their arrival on-site and the time of day when deciding weather to stay and excavate a victim completely and stay with them if they are alive? Or to mark strikes and move on in anticipation of more help arriving. **Areas of improvement** • On site dog care. All dogs not working should be kennelled in a snowcave and have there down coats on. • Better victim management. Live targets need to be insulated from the snow, wrapped in a space blanket and have thermal heat pads. • Better clue and strike marking. Dog teams should use orange flags. Dog handlers should also carry red flags to mark clues.	minutes the roles in the IMT were a little blurred but with such a small team this is impossible to avoid. The emphasis is on the job getting done quickly without regard to who does it. If this had not been an exercise then I am guessing that IC would have grabbed some Police staff to assist with tasks such as log keeping and call making. At 1315 the IC speaks with informant who is at the avalanche site and he asks if he can go onto debris to start a search. This was the only time in the exercise where there was any indecision. While she weighed up the pros and cons of whether or not to let him on the debris the helicopter arrived with a rescue team and the decision became redundant. It was correct to give this careful consideration but perhaps this is something that needs some pre planning. The threat of more avalanches was	

This is not so much a question for the specific SAR teams being deployed by Police, but the Ski Patrol, Heliguides, and other agencies who may be 1st responders. What equipment are teams turning up to the SAR with? • Avalanche TX, Probe, Shovel • First Aid – Heat treatment specific • Overnight gear • Navigation • Comms • Over snow transport – Touring setup, snowshoes				obviously the key consideration and whether or not the informant was qualified to make an accurate assessment of the risk.	
Objective Two		**Identify any training or operational issues with larger scale site management practices with multi agencies**			
We tried to make this scenario one where the rescuers would feel resource shy until further teams arrived, and would be forced to make decisions on how best to use their onsite personnel. Specifically, we set the site up so early finds (from Transceiver and Dog) would need constant medical attention. Unfortunately the cues we attached to the buried victims were either not found straight	**Op Issues-** Police to advise any on site survivors not to approach the helicopter as it lands It would be worthwhile to have a dedicated heli pad for arriving services to: Check –in and record name/presence on site • Direct to ASC location for tasking • Check for TX presence and on to search	**Terminology:** I would suggest that the term ASC is changed to fall in line with standard CIMS / SAR operating terminology so that when occurrences are scaled up with multiple agencies all rescue personnel understand the terminology and use it in the field be it a Climber, tramped, Avo etc etc. **Comms:** Our comms plan predetermines the VHF	**General SAR-ex Feedback** Overall I feel the exercise was of great benefit, not only did it test the pre-plan (if not to the scale we wanted) but it proved that our site practices and personal skills are of a high level. It does seem that we are all very focused of the 'search' aspect of 'search and rescue' and not so much on the 'rescue'. Perhaps this is a scenario related observation,	It is important to note that even though this was an exercise and the rescuers were warned and in a position to mobilise immediately the first team didn't arrive on site till 1320. This is 28 minutes from initial call. I don't believe it could have been done any quicker that that but it does emphasise the point that	**Topics:** • First Party roles, what happens when you introduce a dog? • Start of a large scale SAR, should first party still act like backup is coming? • When should the Accident Site Commander (ASC) join in helping with initial rescue, and when should they step aside? • Survival times. Always search like people are alive, survive statistics are

away, or not acted upon as if it were a real SAR. I believe this can be improved from our side of things with better scenario design, but also that the SAR teams can take training issues away to be worked on.

Taking into account that some cues/clues were not clear for the rescue teams, my opinion of the exercise was that the Search was done well, but the Rescue much less so. Whilst teams found buried people and targets quite quickly, several of these finds would have deteriorated quickly and likely died due to being left alone or insufficient care.

Specific training issues to address:

- More realistic extrication of buried victims to allow assessment.
- Full primary and secondary surveys
- Better patient management. At least stopping further heat loss to victims found alive, before continuing to search for others.
- Communicating the status of victims to the ASC so the ASC can make (triage) decisions regarding the priority of the SAR.

- Relay on-site communication to be used – radio channel (e.g.EXS-07)

Dog teams may consider doing TX site check when resting dog or possibly be accomplished during dog sweep as they are often 1st to debris and could give ASC an indication where to send TX teams as they become available.

Probability of Area (POA) from Avo search theory was not really employed beyond what was being conceptualised in the head of the ASC. Discussing this with a few other key players on site may be useful to prioritise search areas – it should be noted that the search component was not a key issue at this site as much as having available resources to rescue.

ACR and other responding services may consider bringing site warming resources for better managing Avo survivors – e.g. sodium acetate heat packs, sleeping bags, thermo-rest pads, etc

The 3-hole per step course probe method was observed on-site with angled probe insertion. This method makes it easier to miss a victim if it is not performed very well, is harder to manage, and has a lower POD – probability of

channels used in SAR ops. We make no changes for Avo incidents.

In general all those involved had the required channels to communicate effectively however some were using the repeater channel on the ground when all on site communication in a perfect world should be on ESX07 if Appropriate to the terrain.

Communication back and forth from base to the ASC should occur on the repeater channel MS17 or as indicated should a link box or another repeater be used. This will enhance better communication between the Base and ASC and leave the on site simplex channel free for inter-team and ASC communication.

Exercise victims:

Laminated cards were tied to each victim to indicate injuries, a name found by search pockets, wallet, cell ph etc.

This is to ensure the exercise was realistic and victim required ongoing treatment or assistance etc.

We found cards alone were not suited as they were no

and in a real life situation patients would receive a greater amount of attention and care?

The greatest out areas of improvement I believe are as follow.

• Treating hypothermic patients.
o Create a thermo pack.
o Create SOPs around the use / deployment of the thermo pack to ensure this is taken to sight by the 1st ACR team.

It needs to be standard practice that all patients are insulated prior to being put into a ferno or similar type stretcher.

o All avalanche victims should be treated as if they have hypothermia.

• Site flagging/marking.
There were clues on site that didn't get marked / flagged.
o Adopt a flagging protocol.
o Create a flag-bag including laminated protocols.
o Create SOPs to ensure the flag-bag is taken to site by the 1st ACR team.

• Onsite communication.
o Include a loud hailer in the equipment taken to site. This is an effective way for the ASC to communicate

victims are most probably only going to be rescued alive by themselves or people already on site.

As the exercise progressed I observed general communications between the Helicopter Pilot and the ASC. I was very impressed with what I heard and information was passed smoothly and efficiently. Both these individuals seemed to be well on top of their respective games.

Of note the 10 codes used by the ASC and others were different to Police ones and in some cases were perfectly contradictory. This did not seem to cause any problems.

One thing which I wasn't sure of was whether or not consideration was given to an aerial transceiver search or even an aerial visual search.

There was also some confusion at one point as to how many victims were involved but this resolved itself fairly

done on limited data, and new equipment not well tested.
- False hope with quick dog searches?

First party should fly to top of path, dog searcher may need to do transceiver search first?? ASC may need to assist with initial scuff/transceiver search, or go and interview witness. Always start at the top.

First priority is scuff search and transceiver search as per industry accepted SOPs.

Should a dog even go with first party?? Probably; but not worth holding back the party for a dog to arrive. Shouldn't a rescue be run giving priority given to those with transceivers?

Second party members could be assembled with TC locals? Is this in the plan? Would be quicker for a TC backcountry rescue than Cardrona staff.

What happens when dog is introduced to first response party? If insignificant man-power dog handler needs to probe and then decide if he should suspend dog search and dig when a strike is found. In an ideal world a prober (or two or more?)

ASC role – this field exercise was realistic, but only offers one (or two people max) the opportunity to be put into the 'hot' seat. To better capitalise on this opportunity, I would recommend running Table top exercises for the key ASC role prior to the field Exercise. This would help to gain mileage and to develop their decision making skills under various situations, and more easily allow the testing of a 'handover' to in incoming ASC. This would likely help identify personnel that are more suited to this high pressure role, which may help when prioritising who might go in that first helicopter.	detection (65%) than the vertical probe 50cm separation method (88%) –n recommend using vertical 3 hps method. Some confusion on distance between probers was also observed – wrist to wrist is the recommend distance for course probing. Recco was available and was just beginning to be deployed at the 2hr mark. Although both ski fields responded with this technology, only one unit was properly charged for use (due to early season operations not ready yet) Thermal imaging should also be considered as a viable heli-operated search method. **Multi-Agencies Coordination-** Generally, the agencies worked well between each other, aided by the fact that most knew each other and knew of person capabilities and/or limitations. Perhaps providing ASC with support of communicating with outside services (as a matter of course) upon arrival of ASR team - they could also do some note taking and map drawing of scene if not already done, liaise w/ pilot, etc. Any medical staff arriving on	found or ignored in whole or part. A learning point for the running the exercise is to have a referee present when victim are uncovered to direct necessary action and ensure it is carried out. The may help to remove the uncertainty between scenarios and what we **would do in** a real life situation. Given the recent activity on site in burring victims etc it appeared easy for dogs to hone in of everything and anything buried. Consideration is needed to find other ways of setting up the site so it is no so scent rich. **Exercise Proper:** The site accommodated 7 burials: 3 x transceivers 2 x live burials - for dogs 2 x probe only finds **1252- 1255** Witness call to Police **1309** TC radio to patrol advise re Avo and team assembled for deployment **1315** TC 1st response team picked up. (2 x patrol 1 x dog) **1320** TC 1st response On Site. Good flyover recce carried out	to searchers without tying up the radios. It also enables the SAR-ex co-ordinator to call timeout if need be? **Scenario based feedback.** • Important that targets are positioned on site in such a way to be consistent with likely burial areas, and that clues are not only positioned along the fall-line above or below the target, but also correspond with items on the targets so to encourage matching the clues with the victims. • Any information (laminated cards) that is placed with a target should be positioned in such a way that there is little or no chance of the searcher missing it.	quickly. At the conclusion of the exercise seven victims in various states of well being and not so well being had been located and dealt with. The Ops Manager worked methodically and got his teams mobilised calmly and efficiently. I can't think of anything he left out, including simulating getting the BK over from Dunedin and rounding up extra medical staff to deal with the large number of victims. The IC whilst didn't have much of a team to control performed the role of IC extremely well. It is not easy in a situation like this to perform this task as it should be done because there are simply not enough people to delegate jobs to. She had to muck in and get her hands dirty herself.	with a shovel will follow dog handler. No point marking indications and going on if only a small team of rescuers. Dog handler must have a probe and shovel. Even with full scale rescue initiated, things happen, weather changes, stability deteriorates inversion thickens. First party has to remember to work alone until backup is on the ground. Use all manpower appropriately and efficiently. First party should always land at top of site and work down. ASC can be appointed, but I suggest they help with the rescue until second party arrives and/or rescue group size goes above what? 5 or 6 people maybe? I suggest this doesn't happen until scuff and transceiver search is done of the entire site. Survival times are based on limited statistics. Avalanche airbags are getting much more popular. An experienced avalanche technician may fight harder in an avalanche to create an air pocket, manage to keep their airway clear and/or reach an Avalung mouthpiece. The attitude of searchers

	site needs to be made aware of avalanche rescue environment – reporting to ASC, transceiver use, etc. Comms often seems to be an issue, so a function check for batteries, function and channel on radio should be std. procedure for those prior to being deployed to site. Better standardisation of procedure for marking clues, dog indications, etc. – suggest florescent colours w reflective tape for low light/dark conditions complimented with written words as to what they represent for the less educated that may be working on site. Also the adoption of using 2 wands upon detection of clue followed by crossing of wands once area has been probed. Alerting all users and rescue services that heli's in NZ are using latitude/longitude in degrees, minutes and degrees of minutes – those giving references need to be aware of what type of info they are providing - although this info can convert, the error can be in miles if this isn't clarified.	before landing. LZ selected safest possible site with overview. ASC request by IMT and nomination made. **1321** 1 x patrol to top of debris for TX search. **1323** Good sit rep back to base. **1325** Helo tasked to uplift Cardrona team **1336** TX Victim located **1338** 1st live victim located-dog **1341** 2nd TX Victim located **1347** Cardrona Team on site. (1 x dog, 1 x patrol, 1 x Paramedic) 1 Cardrona staff tasked to manage heli pad, record names etc. **1**348 2nd Live victim located - dog **1400** Probe target found by Dog **1417** 3rd TX Victim located **1422** ACR team to site **1414** HMH Heli ski team to site (This group were available earlier but over looked in the tasking by IMT) **1440** Last Probe target found			should be that they are looking for someone alive, even though it might not be that likely. I think someone dressed warmly, with a decent air pocket and/or inflated airbag could last over 3 hours. Maybe overly optimistic, but there you go..... Are we creating false hope with dog searches. I suspect the holes were dug and the victims buried before the start of the SAR. So the victims scent will have permeated up through the snow pack before even T00 in the rescue. I wonder if during training the hole can be dug, aired out, blocks made to cover hole, then at the last minute, place the victim in the hole and cover. Maybe this already happens? After an avalanche is it known how quickly the scent of a victim permeates up through say one metre of snow?? Dogs are an amazing addition to an avalanche SAR and will one day save somebody's life.

Objective Three		**Arrange non-participating staff to be on-site to maximise learning opportunities and outcomes.**			
It was good to have involvement from [redacted] (Tai Poutini) and [redacted] (Otago Polytech)as onsite assessors, as well as having the Tai Poutini Ski Patrol students present at the debrief held at Treble Cone's base building following the event.	This was accomplished by the presence of both Otago and Tai Poutini Polytechnic Instructors observing exercise. Tai Poutini Polytechnic students also attended most of the de-brief. Dissemination of outcomes will aid exercise outcomes and in-site to be shared beyond those attending exercise.	The following is a list of those agencies / persons involved: • Police SAR Wanaka/Qtwn • St John • MSC • Otago Polytechnic Avalanche programme Manager • Tai Poutini Polytechnic Avalanche Instructor • Heli ski guides from Wanaka/Queenstown • 2 Ski field Ski patrol teams (2 other unable to attend due to weather) • LandSAR Avo dogs • LandSAR ACR team • NZMGA Mountain guides • Aspiring Helicopters • Heli Otago (involved in Time lines for Advanced Life Support but not called to respond in real time			
Other Comments					
	Summary: With outcomes achieved and an exercise performed at this level for the first time locally, it was well worth the effort and received well by those attending. If the weather cooperated and allowed heli access, Queenstown could have been included in the exercise.	**Summary:** There were good learning points from an exercise preparation perspective. Unfortunately we could not get the Queenstown people involved but this did give us an understanding of how the weather could affect the plan. It was decided to continue		Summary: It was clear that everyone involved was well trained and it seems that Wänaka has a very capable team ready to respond to time critical avalanche incidents.	**Summary:** Having arrived later in the SAR I may have missed some things. But I did see one dog handler working alone without a probe, then I was sent with two others to probe a flag left in the snow. It was a flag in 2cms on snow over dirt. A waste of time. Dogs seem so good that flags

		with the exercise as we had no guarantee with weather and some of the key players and evaluators were committed to other work post the exercise date. With planning an exercise as in all SAR planning a good weather and bad weather contingencies need to be prepared. For Avalanche training in the main focus seems to be on the search and little on the Rescue or patient management which is equally important. A better use and understanding of CIMS terminology would provide consistency across all agencies.			don't seem like a good idea. Probe a clue, then call in help to dig, or the dog handler digs them selves. It was a good scenario, good practice and a lot of people put a lot of work into it. These things are a great way to improve operations and lets hope it does this. Thanks

Suggested action points based on above correspondence:

DEBRIEF ACTION POINTS	PERSON RESPONSIBLE	DATE COMPLETED BY
Earlier medical support built into pre plan i.e. ski field Doctors, need liaison and discussion to find the best and available resource.	Aaron Nicholson	August 2012
Table top exercise pre winter next year / CIMS	Aaron Nicholson	June 2013
Back filing of Patrol staff from fields to boost 1st response number	Aaron Nicholson	August 2012
ACR team protocols and gear to site in 2nd phase.	one of the LSAR ACR team leaders ?	
Thermal imaging investigation, use/ location etc	?	
Update Pre Plan as above	Aaron Nicholson	Partially completed as attached
Flagging protocol / Use of CIMS / LSAR terminology instead of AVO specific ASC for multi- agency use.	MSC to establish industry standards in liaison with LSAR NZ	?