

SAREX Evaluation Report
Bay of Plenty/ Taranaki Joint Operation –
Fowl
6th September 2015



Operation site: Gully below the rock feature, Policeman, Mt Taranaki.

Prepared by Andrew Hobman and David Dittmer

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Background

From a risk management perspective, an Avalanche Search and Rescue (SAR) response contains many factors that increase the complexity, risk and safety of an operation. Avalanche rescue response:

- Is a time critical, medical emergency
- Requires highly skilled teams to assess and manage the avalanche and other alpine hazards
- Uses multiple Helicopters, operating, loading and unloading people in an alpine environment
- Are low probability/ high consequence events that rescuers and management do not experience often.
- Have the potential to be multi-causality events requiring high numbers of responders
- Involve multiple agencies.

These 'Red Flags' should be considered and prepared for in the response planning and operational management throughout the event.

Key components to increase the chances of a safe and successful operation include:

- Robust planning, reviews and updates
- Competent Field and IMT personnel
- Regular and realistic training.

Mt Taranaki/ Egmont is a popular destination for skiers, climbers and walkers with many activities taking place above the 'snow line'. Any time that there is snow on the ground and the slope angle is steep enough (between 30°- 45°), there is a chance of triggering an avalanche. Natural avalanches can regularly release in terrain at these angles and run significant distances through much lower angled terrain.

There is a well-documented history of very large natural avalanches crossing easy access walking tracks and involvements from human triggered events on Mt Taranaki/ Egmont.

The Central and Bay of Plenty Police Districts have a prime responsibility to respond to Avalanche Incidents within in its policing boundaries including the Taranaki/ Egmont and Tongariro National Parks. The SAR response is generally from the LandSAR Alpine Cliff Rescue Teams (ACR), local ski area staff and guiding companies with Incident Management Team (IMT) support from Police and local resources. The primary role of these groups is to provide a rapid response to an avalanche and other incidents that may occur in the mountains.

There is high value in running realistic large scale, inter-regional training exercises to increase the various agencies level of experience and proficiency, ability to work together, test the Response Plans, improve preparedness and reduce the risk in a real event.

Terms of Reference

This report has been compiled for NZSAR on the Central/ BOP Joint Avalanche SAREX, Mt Taranaki September 6th 2015.

The purpose of this report is to provide an evaluation of the Incident Management Team (IMT) and Field Teams' search and rescue response to an avalanche incident.

The first part of this report will address the Field Teams actions, site management, search and rescue techniques. The second part will evaluate the IMT response, using the template provided by the organising agency.

The authors of this report are experienced Search and Rescue practitioners both in the field and within incident management teams.

Andrew Hobman (Avalanche NZ) is an avalanche risk management consultant and educator. He has worked for the New Zealand Mountain Safety Council (MSC) as the Avalanche & Alpine programme manager, the Department of Conservation as a Search and Rescue Team leader at Aoraki/Mt Cook National Park and is a current member of the Canterbury Alpine Rescue team.

David Dittmer is a manager with the Department of Conservation in Aoraki/Mt Cook National Park, has extensive experience with land and alpine search and rescue in the North and South Island and is a current member of the Mackenzie LandSAR Group.

Summary

On the 6th September 2015 a regional Avalanche Search and Rescue exercise (SAREX) was held on the South-eastern slopes of Mt Taranaki, involving the Bay of Plenty and Central Police Districts, Ruapehu and Taranaki LandSAR teams, St Johns Ambulance and local helicopter operators. Organisational support and SAREX evaluation was also provided by Department of Conservation (DOC) and Avalanche NZ staff.

Exercise Aim: To practically test and evaluate:

- The Taranaki Avalanche Response Plan
- The readiness and response of the Alpine Cliff Rescue Teams and other local resources
- The readiness and response of the Incident Management Team

And to improve co-ordination and cohesion within and across the Police Districts and key responders.

Scenario:

An avalanche incident involving multiple burials of back country users on Mt Taranaki.

The exercise included five burials (3 with avalanche transceivers and 2 without) and was run in 'real time', with the incident reported via the Taranaki Police SAR (On Call) officer and the Search and Rescue operation initiated as per the local response plans. The exercise concluded when the final victim had been evacuated and the rescue teams stood down by the Incident Controller.

A debrief was conducted immediately after the exercise at the Incident Control Point in New Plymouth.

Conclusion:

Overall the exercise was successful and the key aims were achieved. The response of the rescue teams and the Incident Management teams was well tested and a number of clear learning points were identified. Good interaction between the two rescue teams' members and personnel from the Police districts added to an effective set-up and conducting of the exercise.

There were no safety issues for the field teams although the weather conditions were less than ideal and did not allow for the use of a helicopter. The reality of having to walk to an incident site is very real and added a level complexity for the site management and operational effectiveness of the teams.

Part 1: Field Team Evaluation (*Andrew Hobman*)

Key Learning Points

Leadership:

More training is needed for people undertaking a leadership role in the field.

- Specific training for the Avalanche Site Controller (ASC) including Search Theory and the application of CIMS should be developed and courses should be offered on a regular basis.
- Training resources such as Field note books and check lists should be developed and distributed widely.

Marking

All teams should be carrying Avalanche site marking flags that are consistent with the New Zealand standard (see Appendix 5). These should be used at all trainings and real events.

Additional 'marking' equipment should also be carried to indicate specific areas such as Helipads, Medical, Safe Forward Point (Spray-paint or dye) and wind direction (smoke flares or wind wand/flag)

Communications

All teams should be carrying radios and know how to use them.

- Regular training should be undertaken in how to use the radios.
- Check cards, that travel with each radio, should be developed that detail how to use the radios and all the channels available, including other areas/district equivalent channels.
- A communication plan including identification of black spots, repeater options, cell-phone coverage, all channel names and numbers and available radio supplies should be part of the Response Plan and updated regularly.

SAR Teams

All team members need to undertake regular training in:

- Transceiver searching with specific focus on deeper burials,
- Digging including V shaped Conveyor Belt approach,
- Probing; to pinpoint the victim and formal Probe-lines.
- Patient care including hypothermic victims and the latest international guidelines.

All team members should be prepared for unexpected situations and to be self-sufficient.

They should all be carrying:

- Overnight gear, including shelter, food and extra clothing,
- Communication devices,
- Medical kits,
- Equipment to 'walk out' in, including maps/compass, crampons, ice axe, rope (short), slings, carabiners etc.

Equipment

All teams should be arriving at a training or real event with adequate medical equipment to attend injured parties and transport them from site, including:

- Rescue stretchers (collapsible, rigid or soft),
- Additional weather protection for the patient including Sleeping bags, blankets, mats, bivi bags, face shields etc.,
- Shelter. A tent or bothy bag,
- A comprehensive First Aid kit including cold injury treatment.

Additional training and familiarisation in the Recco search device would be good for all teams. Although these are not currently available in Taranaki, work is being done to obtain one for the area. The RARO team should also ensure that one is available and included in all training events and real operations.

Recommendations

Police/ NZSAR:

- Continue to support and run large scale, multi-agency avalanche IMTEX and SAREX's.
- Include the medical response and evacuation of patients in any future exercises as this is a critical part of an avalanche rescue.
- Support opportunities for Police districts to share and develop Avalanche Response Plans.

In New Zealand, large scale avalanche rescue operations are rare and teams and search managers have limited opportunities to experience what can be a complex and high risk SAR operation. A highly effective way to prepare people for these low probability/ high consequence events is regular and realistic training.

SAR team leaders/ training co-ordinators:

- Run regular training on personal transceiver searching skills, digging, probing, visual searching, triage and patient care.
- All potential responders should familiarise themselves with the latest ICAR protocols for handling avalanche/ cold injury victims.
- Ensure large numbers of marker wands are available. Flags should be colour coded using the New Zealand standard.
- Run regular training on radios use. Include 'How to use' check cards and ensure all radios are compatible with other areas DOC and SAR channels.
- RECCO should be used and designated RECCO searchers should be listed in the pre plan.
- All rescuers should have done some CIMS training.
- Ensure that teams are full equipped for an avalanche SAR including cold injury treatment, patient protection and team members prepared for unexpected situations including having to walking out or spending the night in the field.

Avalanche NZ and LandSAR:

- Develop some specialist training on avalanche site management for anyone likely to be the Avalanche Site Controller (ASC). Include resources like Field note books and check lists.
- Continue to support SAR groups in avalanche rescue training and resources.
- Support the Police in development of Response plans, ITM training and IMTEX/ SAREX planning, running and evaluation.

Findings

Field Team Response

The first team was on site 78 minutes after the initial call for help was made. This is a realistic time for an organised rescue team to respond to an incident on Mt Taranaki and could be considerably longer if weather conditions do not allow the use of helicopters. Each teams' departure from the staging area was well spaced and managed to reflect a real event.

The weather on the day of the exercise was poor with very low visibility, moderate snow fall and strong winds. The teams had been preassembled at the Stratford Ski Area car park to allow a for a safety brief and limit the expense of any possible flying time but due to the weather, they were required to walk to the incident site, which took around an hour. This situation caused a number of issues including rescuers and the dog arriving on site physically tired, critical items like rescue stretchers, radios and medical kits were left behind. A small amount of radios did arrive on site however there was not a clear communication plan.

A partial excuse for the lack of equipment was the assumption that it would either be provided by the local area teams and that it would be transported to site by helicopter. Once this option was unavailable the teams were under prepared and only limited equipment was available by road transport.

As the teams arrived onsite, the first victim was located and recovered quickly however a nearby deeply buried victim distracted the search effort and soaked up extensive resources. It was some time before the entire avalanche debris was searched visually or with a transceiver and victim 1 and 2's medical conditions declined rapidly, eventuating in fatalities. Better site management and patient triage would have significantly improved the victims' probability of survival. Given the narrow, 25m, debris it should have taken around 10 minutes to Transceiver search the entire site¹. A single searcher could have walked straight down the middle of the debris and easily picked up any transceivers, while also undertaking a visual search for clues. By tasking someone to search the entire site early in the operation, victims 1 and 2 should have been located up to an hour earlier than they were.

Leadership- *Avalanche Site Controller (ASC)*

The initial actions of the ASC were positive and well directed but the lack of communications with the other arriving teams and no Safe Forward Point (SFP) to brief them meant that control of the site soon became very difficult and the search lost momentum. Further to this the second team arriving on site began 'self-tasking', undertaking a search at the bottom of the avalanche debris without communicating with the ASC. Another issue was the poor transceiver searching skills of some of the team members which meant that the ASC was drawn into instructing them and undertaking the search himself.

Positioning:

The ASC was well positioned in the middle of the debris and moved around to attain information. He maintained an overview role and managed well not to become too involved in searching, digging or managing patients.

¹ Effective sweep width of 20m at 2km/h = 667m² per min - 99% POD

Span of Control:

The ASC needed to appoint various roles to other people to allow him to accurately assess the scale and progress of the operation and maintain a level of control. By applying CIMS structure he would have had better support in decision making and made better use of the resources available. A scribe and communications person needed to be used early in the operation. The search area was long, at 369 meters, and poor visibility combined with a lack of radio communications meant that information and control was difficult to attain. Dividing the site into segments and assigning search/digging and medical team leaders to each, would have been beneficial.

Safe Forward Point (SFP):

The lack of a SFP meant that it was difficult for the ASC to understand how many people were on the site, issue taskings and maintain overall control. The visibility and communication issues contributed to teams arriving at different areas on the site and then starting tasks without direction or dumping their gear and recovering from the walk in. A designated and marked SFP, with someone in charge to direct them, would have allowed the arriving teams to rest and prepare themselves before being given a tasking and entering the avalanche debris. Although this was a scenario, in a real event the weather and snowfall would also have increased the chance of additional avalanches and thus required an increased safety margin. Keeping minimal people on the site and good record keeping of who was is an important role of the SFP leader.

Marking and recording

As mentioned above the lack of a scribe to record the timings and actions, as well as acting as a sounding board for decisions, meant that there was a heavy onus on the ASC to control everything. Another key tool for the site search management is to draw a map of the debris. This would have helped to define the extent of the site, especially given the poor visibility and the length of the search area. It was fairly late in the search before the upper third of the site was given attention and this effected the medical outcome of at least one victim.

Site and clue marking, with coloured flags, also greatly increases the effectiveness of the ASC and searches. The dog handler did have making flags but there were no other standard avalanche site marking flags used.

Communications

Communication has been a constant issue in all the avalanche SAREXs' run since 2010. It is a critical obstruction to a safe and effective operation and solutions need to be found. A clear communications plan should be part of the Response Plan including identification of black spots, repeater options, cell-phone coverage, all channel names and numbers and available radio supplies. Establishing the communications plan is usually an early task for the IMT, however additional responsibility on behalf of the operational teams is needed, giving the rapid SAR response required in an avalanche incident.

Teams may not have the opportunity to gather at the usual briefing point or equipment stores and consideration should be made for radios to be carried by all teams as part of their basic kit. They should be a fundamental piece of equipment that stay with the team members, preferably designated to each member and kept in their packs. All team members must be well trained in how to use their radios, including changing the channels, and have printed cards with instructions and the

various channels available in each district including Police, SAR, Helicopter, DOC, Ambulance and repeaters.

Teams need to regularly train on radio use including locking/ unlocking key pads and changing channels in adverse conditions. It is easy to forget exactly how they work especially when there are a variety of models and brands available. Separate designated channels for use between the field teams /ASC and between the IMT and ASC should be clearly understood by everyone.

Personnel SAR Skills

Over all, the transceiver searching, probing and digging skills of the teams were adequate but it was obvious that more regular training is needed for people to be really efficient in these tasks. The deep burial caused a fair amount of confusion and wasted effort by having multiple searchers checking and rechecking the area and then multiple people probing to confirm a strike.

Deep burials are always difficult to detect and recover. The teams need to practice transceiver searching for burials deeper than 1.5 meters and understand how their transceivers will react.

The digging for buried victims was also, at times, unorganised and not as effective as it could be. Digging is the area in a rescue where minutes can be saved and having a leader and a team that clearly understand the principals of V shaped Conveyor Belt approach really improves the time it takes to recover a buried victim.

Patient management appeared to be good and everyone was engaged in handling the patients and their various injuries despite the artificial nature of dummies and role playing. The lack of equipment on site meant that people were not able to fully deal with cold and injured victims or complete their evacuation. It would greatly improve the value of the exercise to ensure that teams were equipped with stretchers, mats, sleeping bags, heat packs, shelter etc. to realistically package and evacuate the victims.

As mentioned above, many items of equipment (both personal and team) did not arrive on site or were not used. When it was clear that no stretchers had been brought to site, team members were asked if they at least had personal sleeping bags or bivi bags to protect the recovered victims. None could be offered and a silver space blanket was the best item available. An emergency stretcher, made from a climbing rope, was created and used to some effect to evacuate a victim however this would have been less than ideal if this was a real event.

Teams need to ensure that they are fully prepared for any sort of alpine rescue and should all be carrying the following minimum items:

- Marking for Helicopters - Spray paint or dye, Smoke Flare/ wind indicator
- Flags/ marker wands,
- Stretchers,
- First Aid kit– including cold injury treatment,
- Patient protection – warm, weather-proof,
- Food/ water (for patients and self),
- Overnight gear,
- Shelter,
- Communication devices – radios,
- Navigation- maps/ compass.

Conclusion

The exercise successfully highlighted a number of learning points and areas of improvement for the field teams. The weather conditions and walk in, further tested the personnel attending but they were all motivated and participated fully. The team members from Taranaki Alpine Rescue and Ruapehu Alpine Rescue worked well together and supported each other in trying conditions.

The difficulty of the ASC role was once again brought to light and this position needs far better support through training and resources. As with all the people attending, there are limited opportunities to practice and preform these roles, so it was highly valuable to run this exercise on Mt Taranaki and involve a wide range of Police and rescue personnel.

It was unfortunate that the teams were not able to work with the local helicopters and pilots because this adds another level of complexity and risk. Hopefully there will be further opportunities to allow this training, which will improve the understanding of all parties on the expectations and limitations of these aircraft as well as familiarity and trust in a real event.



Photo: NZ Police

Part 2: Incident Management Team Evaluation *(David Dittmer)*

Key Performance Indicators

| Objective # 1 | To practically test and evaluate: <ul style="list-style-type: none"> • The Taranaki Avalanche Response Plan • The readiness and response of the Alpine Cliff Rescue Teams and other local resources • The readiness and response of the Incident Management Team | | | | | | | | | | | | |
|-----------------|---|------------------|---|---|---|---|---|---|---|---|----|----------|---|
| KPI Description | Evaluation Criteria | Evaluation Grade | | | | | | | | | | Comments | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | |
| Taskings | Was it appropriate? Who activated it? | | | | | | | | | | | ✓ | Tasking's were reflex in nature and activated by Avalanche Site controller. |
| Resources | Were the correct resources used in a timely manner and in the correct order? | | | | | | | | | | | ✓ | Helicopter resources because of inclement weather could not operate. Field response personnel had to deploy on foot from Stratford Plateau carpark. |
| | Were resources tracked? | | | | | | | | | | ✓ | | Field resources were tracked by the IMT Operations team during the operation |

| Objective # 2 | To provide all participants the opportunity to refresh and practice their search and rescue incident management knowledge and skills during a full scale operational exercise previously learnt during Avalanche training, CIMS courses, Avalanche SAR Controller courses and through own experiences and to identify gaps and areas that need further development. | | | | | | | | | | | | | |
|-----------------------|---|------------------|---|---|---|---|---|---|---|---|----|----------|---|--|
| KPI Description | Evaluation Criteria | Evaluation Grade | | | | | | | | | | Comments | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | | |
| Information gathering | Correct briefing and tasking from ICPs | | | | | | | | | | | ✓ | Full briefing provided by event organizer S/Sgt Thomas McIntyre | |
| | Was the correct information received? | | | | | | | ✓ | | | | | Information was obtained from the “arranged party informant” and from Avo. Rescue site. However this proved difficult for the IMT through difficult cell phone and radio communications | |
| | Was contact maintained with the informant? How? | | | | | | | | | | | | ✓ | Contact was maintained with the “exercise informant” |
| | Was the information analysis done correctly? | | | | | | | | ✓ | | | | | Information analysis was completed, however there was some delay and minimal use of acknowledged local alpine experts for advice |
| | Was the information disseminated correctly? | | | | | | | | | | | | ✓ | Information flow for the first hour was held within the G/Man log system and IMT notebooks. Prompting initiated white board use across the IMT functions with a status board, time line, team taskings, etc. |
| | Was the information confirmed by independent means? | | | | | | | | | | | | | N/A – exercise scenario |

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| KPI Description | Evaluation Criteria | Evaluation Grade | | | | | | | | | | Comments | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | |
| Incident Management Team setup | Was the IMT established in a timely manner to reflect a real time scenario? | | | | | | | | | | | ✓ | ICP – Team established in realistic time frame as would be expected for an avalanche emergency. Being an exercise there were more IMT staff available from across the region than one could expect in an actual event |
| | Did IMT members know their roles and responsibilities? | | | | | | | | | | | ✓ | ICP – Most of the staff understood their roles, however some coaching was required during the exercise |
| | How did the transition from Reflex tasking to full formal search planning go? (OG-Full IMT) | | | | | | | | | | | ✓ | ICP – The scenario remained in Reflex tasking mode, towards the latter part forward planning was actively being done by operations, intel/planning and logistics. |
| | Was the room laid out correctly to allow the IMT to work properly? | | | | | | | | | | | ✓ | The Taranaki Civil Defence building layout is not totally ideal for SAR. The Taranaki SAR IMT group should reflect on their exercise experience and change several of the IMT locations to ensure the work flow is more efficient. e.g. – Operations team should be adjacent to the radio room. |
| SAR Plan | Was the Incident Action Plan (IAP) appropriate to the scenario? | | | | | | | | | | | ✓ | The IAP was prepared using a dated template. However it was prepared and should have been updated after each IMT group meeting |
| | Was the IAP checked? | | | | | | | | | | | ✓ | The IAP was checked and was reviewed with regular meetings |
| | Did the plan work? | | | | | | | | | | | ✓ | The exercise plan worked |
| | Did everyone including the Operational groups on the ground know the IAP? | | | | | | | | | | | ✓ | The field teams were briefed on safety for the operation at Stratford Plateau, however did not have opportunity for a briefing of the IAP. The IMT group all had a briefing on the IAP |

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|------------------------------|---|------------------|---|---|---|---|---|---|---|---|----|--|
| KPI Description | Evaluation Criteria | Evaluation Grade | | | | | | | | | | Comments |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| Incident Controller | How did the Incident Controller perform? Did he have control of the incident? | | | | | | | | | ✓ | | The appointed IC was proactive and had control of the incident, appointing Ops-Intel/Planning-Logistics-Safety managers. |
| | Did the controller hold regular meetings? | | | | | | | | | | ✓ | The IC held regular IAP meetings, where updates on actions achieved and decisions determined |
| | How well was the Media managed? | | | | | | | | | | | N/A – exercise – however publicity photos were taken of the mtn teams |
| Logistics | How did the Logistics team perform? | | | | | | | | | ✓ | | Logistics manager & team completed planning for a continued operational period |
| Operations | How did the Operations team perform? | | | | | | | | ✓ | | | Ops Manager kept track of reflex tasked resources, did have difficulty with field com's at times. |
| | How did the sector supervisors work? | | | | | | | | | | | N/A |
| | Did the section supervisors work together? | | | | | | | | | | | N/A |
| Scenario Analysis / Planning | How did the Planning team perform? Did they assess the 'what if's'? | | | | | | | | ✓ | | | Planning Manager/Team required some prompting but developed timeline and planning for a continued operational period |
| | Planning teams reviewed other avenues and possible scenarios. | | | | | | | | | | | N/A |
| | Did the Planning team plan forward for the next operational period? | | | | | | | | | ✓ | | Completed some forward planning in conjunction with Logistics. |

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| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | |
| Logging of actions taken in ICP | Were actions logged using a simple system? | | | | | | | | | | | ✓ | All – standard log was kept, work load shared among available personnel. |
| | How was the passage of flow of information? | | | | | | | | ✓ | | | | All – radio messages shared via G/man. At times delays in information being received by Ops-Intel/Planning. Cell phone communication frequent. |
| Radio Procedure | Was the correct radio procedure used? | | | | | | | | | | | ✓ | All - radio procedure was sound. |
| | Was correct radio security observed? | | | | | | | | | | | ✓ | Correct radio security, AREC operators. |
| Communication and information | How good was communication between members of the IMT? | | | | | | | | | | | ✓ | Good communication and discussion between IMT team, regular meetings |
| | Was the comms room manned to the correct level? | | | | | | | | | | | ✓ | IMT was for this exercise over staffed, however a beneficial training event for all |
| Documentation | Was the documentation kept in good order, adequate and legible? | | | | | | | | | | | ✓ | IMT log, radio log and white board information was managed well |
| | Did all managers keep a log of actions and decisions? | | | | | | | | | | | ✓ | Logs kept by each manager plus G/Man. Managers would have benefited with a dedicated log keeper. |
| | Was all takings written and collated with appropriate sign offs? | | | | | | | | | ✓ | | | Field exercise directed on scene by the Avalanche scene controller. Verbal direction. |
| | At the end of the exercise collect all documentation as if they were going to Coroner’s Court! Are they adequate? | | | | | | | | | ✓ | | | IMT exercise, however the log and IAP plus photos of whiteboards were kept. |

End of Exercise Report

All Evaluators to write a brief report using the following subject headings and provide a written copy of KPI comments.

| | |
|---|---|
| Introduction (your location etc...) | Evaluator – Dave Dittmer, Department of Conservation, Aoraki/Mt.Cook, assisted by Barry Shepherd, NZ Police at the Exercise IMT, located at the Taranaki Civil Defence Building, (TEMO) – Robe Street, New Plymouth |
| Exercise Overview (what part of the exercise did you observe) | <p>Observed the IMT briefing, Establishment and operation of the IMT during the exercise on Sunday 6th September, 2015.</p> <p>Present at the IMT location when the exercise activation call came at 09.40 and observed, coached and supported where necessary the IMT team members as the exercise unfolded during Sunday and provided a “Hot de-brief” for the IMT at the exercise conclusion 15.05 in the afternoon.</p> |
| Analysis on how the Exercise went (subjective opinion of how groups performed) | <p>The IMT for the first hour did lose valuable time while a number of personal in training gained a grasp of the situation they were trying to manage. A time out was called and a focus and direction was provided on key aspects that needed managing.</p> <p>The IMT team members were receptive to suggestions and worked well together as a group. They responded to prompts. and developed a sound operational plan with regular IMT management meetings</p> |

| | |
|---|---|
| <p>Observations, conclusions and recommendations</p> | <p>The majority of the IMT personnel had not experienced a rapid response rescue situation previously. In brief recommendations to consider:-</p> <ul style="list-style-type: none"> • Develop a preplan for the Taranaki Mountain location with brief sequential actions to take for a low probability high consequence incident. • Use initial response guide from the NZSAR site • Use early in the IMT expert mountain & medical people for advice and technical information to support planning and operational direction. • The interagency response was really good and future exercises should be planned to build skills and capability. • The exercise objectives were achieved and most personal involved in the IMT came away with a positive experience and additional knowledge and skills to apply for future emergency situations. |
| <p>Possible corrective actions</p> | <ul style="list-style-type: none"> • Think about the TEMO room layout. A few layout rearrangements would assist the operational and information flow on the whiteboards. • The Situation board must be visible to all new arrivals and kept updated as the incident evolves. • IMT Managers should routinely wear role ID vests. • Appoint a principle log keeper to capture record all actions- decisions, verbal-cell phone & radio communications. Each IMT section in a large operation will require a log keeper. • Electronic logs – G/man or similar must have a printer connected to print copies of incoming-outgoing messages to be distributed around Ops, Intel/Planning & Logistics. • Communications pre-plan should be developed. Some thought and planning is needed as yet again poor or lack of radio coms made direction of the operation difficult. • IMT staff should take up training – role playing opportunities when available. The CIMS – IMT roles/system are transferrable to a host of emergency situations |

Appendix 1: Site details

| Location | Path | Length of Path | Elevation at top of debris | Elevation at bottom of debris | Length of debris | Width of debris | Area of debris |
|-------------------------------------|--|----------------|----------------------------|-------------------------------|------------------|-----------------|--------------------------------------|
| South-eastern slopes of Mt Taranaki | Gully below the rock feature known as Policeman. | 650m | 1675m | 1507m | 369m | 25m max | 7595m ² (0.76 Hectres) |

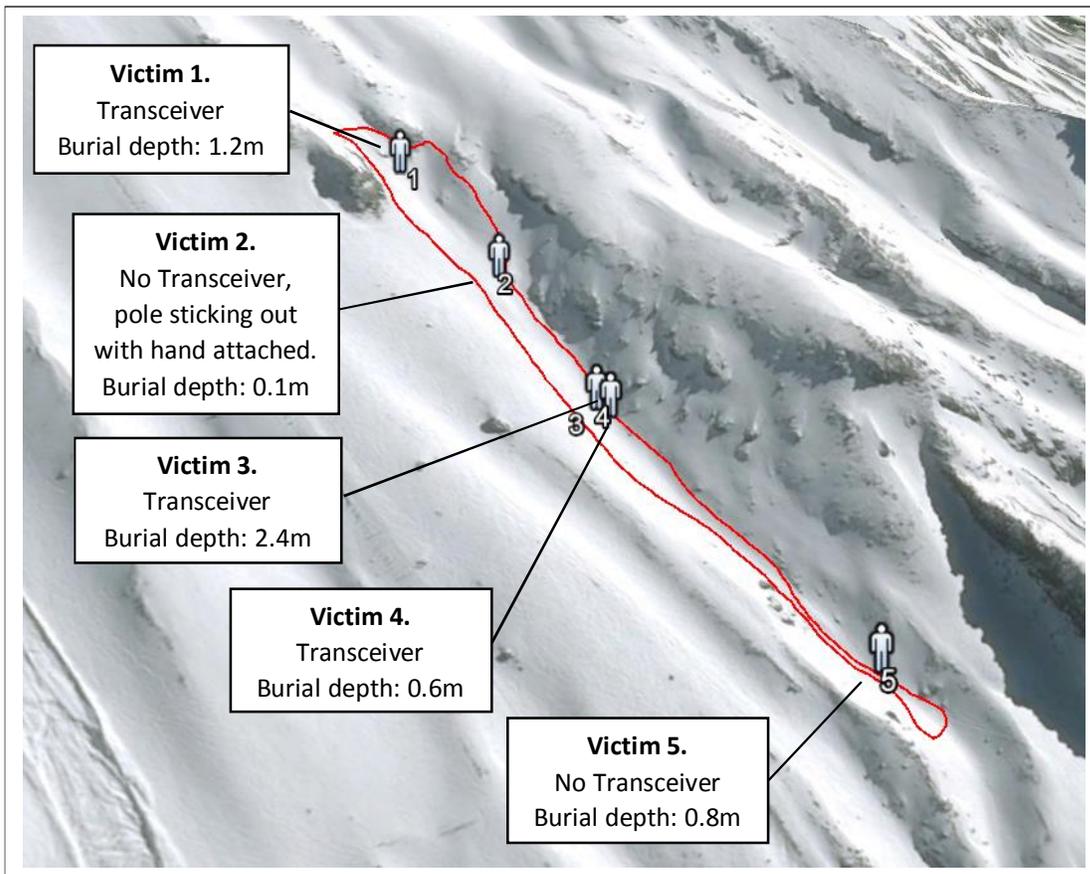


Fig 1: Position of victims in the debris (outline marked in red) and burial details.

Appendix 2: Victim recovery details

| Order found | Time when located | T= (Min) | Location method | Time when recovered | Total recovery time | Depth of burial |
|--------------------------------|-------------------|----------|-----------------|---------------------|---------------------|-----------------|
| 1 st Victim (No. 4) | 11:17 | 97 min | Transceiver | 11:25 | 8 mins | 0.6 m |
| 2 nd Victim (No. 3) | 11:30 | 110 min | Transceiver | 12:19 | 49 mins | 2.4m |
| 3 rd Victim (No. 5) | 12:00 | 140 min | Probe line | 12:08 | 8 mins | 0.8 m |
| 4 th Victim (No. 2) | 12:38 | 178 min | Dog/ visual | 12:48 | 10 mins | 0.6 m vertical |
| 5 th Victim (No. 1) | 12:45 | 185 min | Transceiver | 13:05 | 20 mins | 1.2 m |

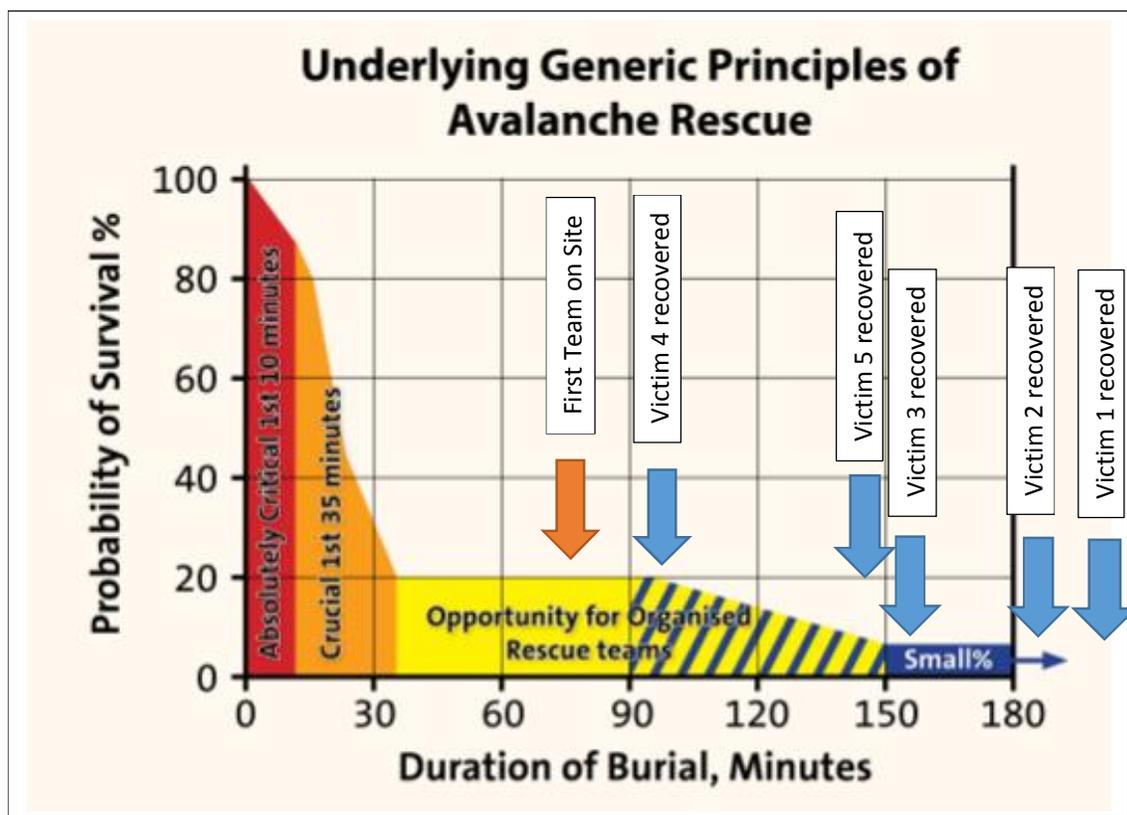


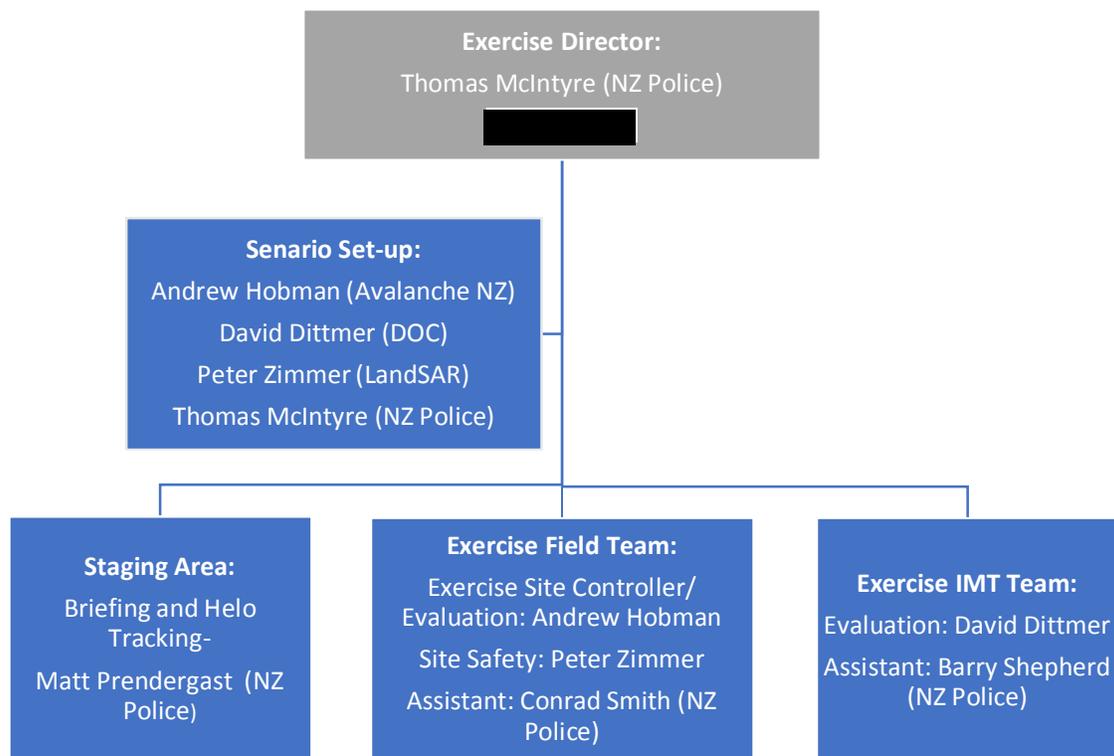
Fig 2: Recovery times overlaid on the Probability of Survival graph.

Appendix 3: Operation timeline

| Taranaki SAREX 15-9-15 | | | | |
|------------------------|--------------|---------|------------------------------|-----------------------------------|
| Time | Elapsed time | T= | Details | Additional info |
| 9:40:00 | 0 | 0 min | Initial call made | |
| 10:58:00 | 1:18 | 78 min | 1st Team on Site | 2 Pax- ASC established |
| 11:17:00 | 1:37 | 97 min | Victim 4 Located | 2 x clues checked |
| 11:20:00 | 1:40 | 100 min | Victim 4 - Head cleared | |
| 11:25:00 | 1:45 | 105 min | Victim 4 Dug out | |
| 11:27:00 | 1:47 | 107 min | 2nd Team Probing Victim 5 | 3 Pax - Taranaki SAR team probing |
| 11:30:00 | 1:50 | 110 min | Victim 3 Located | |
| 11:47:00 | 2:07 | 127 min | Victim 4 prepped for evac | good medical management |
| 11:50:00 | 2:10 | 130 min | Start digging for V3 | TACR x 5 Pax on site |
| 12:00:00 | 2:20 | 140 min | Victim 5 located | 3 Pax |
| 12:05:00 | 2:25 | 145 min | Victim 3 dug to leg | |
| 12:08:00 | 2:28 | 148 min | Victim 5 Dugout | |
| 12:09:00 | 2:29 | 149 min | RARO + 1 x dog on site | |
| 12:13:00 | 2:33 | 153 min | Victim 3 head cleared | |
| 12:21:00 | 2:41 | 161 min | Dog tasked to clear upper | |
| 12:34:00 | 2:54 | 174 min | Victim 2 - clue located | |
| 12:38:00 | 2:58 | 178 min | Victim 2 located | Dog strong indication |
| 12:38:00 | 2:58 | 178 min | Victim 1 signal picked up | |
| 12:45:00 | 3:05 | 185 min | Victim 1 Located | |
| 12:48:00 | 3:08 | 188 min | Victim 2 dug out | |
| 12:54:00 | 3:14 | 194 min | Victim 1 head cleared | |
| 13:05:00 | 3:25 | 205 min | Victim 1 dug out | |
| 13:20:00 | 3:40 | 220 min | Victim 1,2 lowered from site | |
| 13:33:00 | 3:53 | 233 min | Exercise over | |

Appendix 4: Exercise Organisational Structure

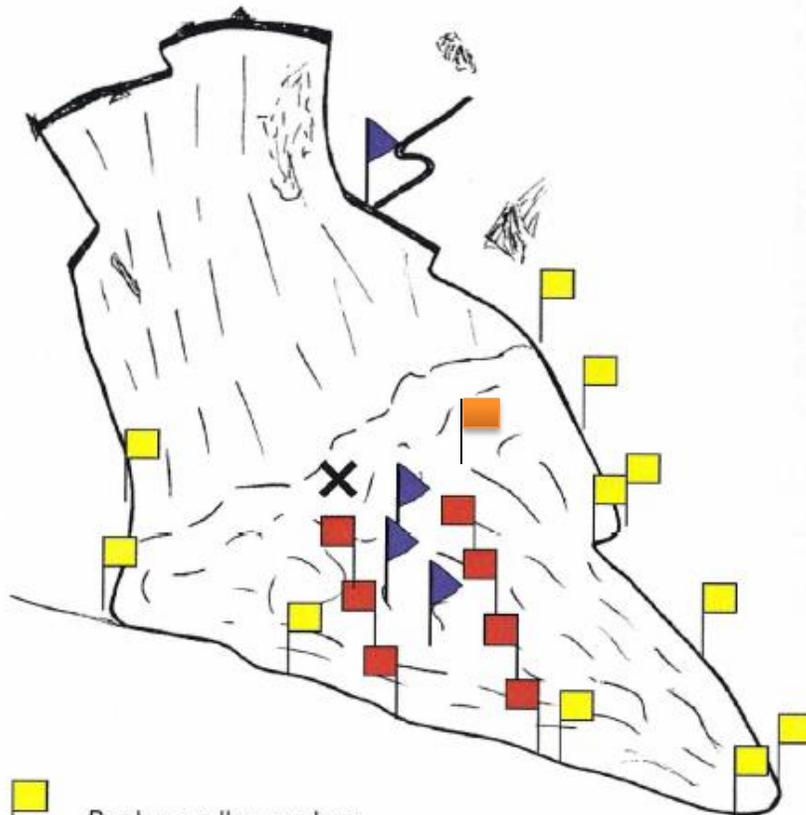
| | |
|--|--|
| Date: Sunday 6th September 2015. | Location: Mt Taranaki/Egmont National Park |
| Response Lead Agency: New Zealand Police | Exercise Planning: Police with assistance from the Exercise Co-ordination Team |
| Exercise Co-ordination Team: Bill Nicholson/ Thomas McIntyre (NZ Police) Andrew Hobman (Avalanche NZ) David Dittmer (DOC) Peter Zimmer (LandSAR) | Exercise Evaluation: Field: Andrew Hobman IMT: David Dittmer |
| SAR Participating Agencies: NZ Police LandSAR (TACR/ RARO) Department of Conservation NZ Avalanche Dogs Manganui Ski Area BECK Helicopters Taranaki Rescue Helicopters St Johns Ambulance | Budget Provider: NZ SAR Secretariat |



Appendix 5: New Zealand Avalanche Site Marking Protocol

Marking of locations on an avalanche

according to ICAR (International Commission for Alpine Rescue)



-  Border = yellow markers
-  Probed area = red markers
-  Entrance track from involved persons (maybe exit track), persons and objects found = blue markers (maybe with clearly visible numbers)
-  Last-seen point = two crossed objects

-  Dog clue = Orange marker

Flags marking indications and clues are used in pairs (joined in the middle with a rubber O-ring) and placed side-by-side vertically with the flags opposing to maximize visibility.

Once a clue or an indication has been checked the flags are then re-set in the crossed position.

If a flagged area has been double-checked a second pair of crossed flags can be used.

All flags remain in position until the search has been completed.