

Critical analysis of the response to a critical incident.



**An intense day on Crib Goch
on
Saturday 7th March 2020.**

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1 Critically reflect on the antecedents and prevailing conditions relevant to the cases being studied:

Context

The relevant minute leading to the incident

Antecedents

The prevailing conditions

The events from when the casualty fell

2 Suggest a range of pragmatic preventative and remedial measures relevant to the case being studied:

3. Demonstrate the ability to critically assess and respond positively to critical incident scenarios in a range of complex and/or unpredictable contexts

Conclusion:

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Appendices:

Appendix A – Example risk assessment by J Laytham

Appendix B – Llanberis Mountain Rescue – advice for Snowdon

Appendix C – Snowdon Horseshoe Route

1. This report will consider the antecedent's and predominant environmental conditions following a challenging hike towards the Horseshoe route of Snowdon on 7th March, 2020, and the immediate unfolding after effects of one critical decision.

Context:

Mountain Hiking is defined as “as walking in mountainous surroundings, mainly on official hiking trails, but also off official hiking trails on small paths or in loose terrain”, (Faulhaber *et al.* 2017).

Climbing has been described as “traversing, abseiling or scrambling over natural terrain” (The Health & Safety Executive, 2004) and this is legislated by *AALR (Adventure Activities Licensing Regulations, 2004)*. Licensing is only required for those providing adventurous activities for young people to experience exciting and stimulating activities outdoors.

The relevant minute leading to the incident:

Having successfully negotiated the notorious razor ridge of Crib Goch, two hikers, H1 and H2, met up with like-minded hikers H3 & H4 at the end of the Pinnacle on the Crib Goch ridge. It was at this point that H3 and H4 were abandoning their attempt to complete the Snowden Horseshoe (see appendix C) as they believed the wind conditions were getting too dangerous.

A decision was made by all four hikers to descend via the steep grass slope as a short-cut to join the PYG track: a well-known hikers trail back to Llanberis. As the four hikers placed their first steps down the slope, hiker 4 slipped, and the situation turned from relative-safety to life-threatening.

Antecedents (pre-planning):

First, we need to consider the antecedent conditions – these are described as:

“systems that precede and influence the onset and magnitude of a hazard and its consequences. They are distinct from, but influenced by, what are commonly referred to as preconditions” (Crozier *et al.* 1989).

In general, preconditions are considered to be the “things” that influence the outcome – the verb means *to prepare something*. In this case, it was the preparation, or lack of it, that contributed towards the incident.

For a strenuous mountain hike like Snowdon, the minimum pre-planning consideration would take into account the competencies of those involved, route planning, emergency procedures and alternative routes, weather reports, suitable formal hiking clothing and equipment.

You would also expect to speak to specialists for advice, particularly on the day of the hike. Llanberis Mountain Rescue say that “all paths and routes up Snowdon have their risks and dangers. If you are considering a day on Snowdon, then preparation is the key” (2001) and they have 10 tips on this - see Appendix B. Often you need only remove one of the pre-planning stages to affect the outcome of the whole expedition. Carrying out an assessment of the risks that could occur, is an essential part of the preparation.

The prevailing conditions:

The prevailing weather conditions of an area are often determined by location, height, latitude, and altitude.

The Met Office offer advice on the prevailing winds on Snowdon, which originate from the south-west and although they can be warm in summer, at higher altitudes in the winter, the air cools rapidly, condensing and forming ice and snow along with a high wind speeds and winter daytime temperatures of -2 degrees Celsius. When the wind picks up on Crib Goch, then it's usually much stronger and extremely dangerous on the next section of the Horseshoe, called Garnedd Ugain.

“The route up Crib Goch and along the ridge is extremely dangerous and should not be attempted by novice walkers. The risks in winter months are elevated dramatically, and additional skills, equipment and knowledge are required” (Llanberis Mountain Rescue, 2021)

The route down to the PYG track is steep, smooth, and dangerous at the best of times, but the weather and time of year brought additional risks making the ground extremely slippery. From the video evidence (Brave Dave, 2020), there was no visible route and there were a lot of deep snow and ice patches on the ground.

The events from the time when the casualty (hiker 4) fell:

As the group began their decent, they were all in a well-spaced vertical line formation, with the lead H1 at the front, his mate H2 in second place, with H3 next and H4 at the rear. H2 shouted and as H1 turned around he saw H4 sliding down the slope at great speed when he suddenly hit an outcrop of rock and disappeared out of site into the mist.

The remaining group's immediate reaction to this was to run down the slope to catch-up with H4 as quickly as possible; however, H1, a competent hiker, fell himself and started sliding rapidly, but luckily, he came to rest alongside the others. The group quickly realised the seriousness of the incident unfolding. They had no idea in which direction H4 had gone, but H1 said that they could be considering a fatality, and could be heard saying in the video “I'm going to have to call mountain rescue” (Brave Dave, 2020).

As they continued to descend to find H4, they assumed he could only have travelled in one direction so all three stayed together and kept going down, while taking care not to slip again themselves. Hiker H1 told H3 to call Mountain Rescue via the 999 service. As H1 & H2 continued, they heard someone call out, and following the sounds H1 quickly came across H4 who was clearly injured, but conscious and talking.

It was obvious the casualty (H4) had a head injury with an open wound, and when asked about his injuries he was able to say that his right knee was in extreme pain, along with his hand and there was evidence of grazing along his back – these injuries caused by numerous impacts with the rock outcrops.

H1 immediately started assessing the injuries to H4 and the priority was to get H4 off the snow he was lying on and get him some shelter from the wind, while reassuring him at the same time, and avoiding hypothermia;

“injured patients in whom hypothermia develops have a higher mortality than do patients with a similar injury severity who remain normothermic (normal body temperature). Prevention of further heat loss is achieved by maintaining the patient in a thermoneutral environment at high ambient temperature” (Smith, 2001) – insulate against the cold !

H1 clearly assumed the role of leader, and rolled and lifted the casualty in order to slide material between the casualty and the snow/ground, and to form a “shelter” around him as protection. The casualty had his shoes and trousers ripped off him during his fall, and was exposed to the elements. H1 told H2 that there didn’t appear to be any obvious leg-breaks. H3 joined the group while on the phone talking to Mountain Rescue and provided all relevant information, including a rough location, number in the party and details of the casualty and his injuries.

The casualty stated several times that he couldn’t move or feel his right leg and hand, and H1 said that was probably due to the cold, and while wrapping him in items and an orange bivy-bag/tent to cover the casualty from the wind, he was clearly in a great deal of pain from his injuries. H1 then realised he needed to attend to the open-wound head injury, and they were all talking to the casualty to ensure he stayed awake, and told him that mountain rescue were on their way. They all soon realised that he probably had sustained a broken leg.

The casualty, who they now realised was seriously injured, had been lying on snow, frozen ground and exposed to the elements for more than 15 minutes.

Hiker 1 then left the others to go and meet-up with mountain rescue on the PYG track, and lead them up to the casualty – he said he had a compass and whistle. On the PYG he encountered a group with a Nurse, but she couldn’t go up to the casualty, however she gave H1 some pain killers which he then took back to the casualty, along with another group of hikers he met on the path. This proved to be a great morale booster for both the casualty and hikers H1,2 & 3.

The casualty had been lying there for about an hour and his condition was worsening by the minute, and then a mountain rescue member arrived and quickly took charge of the situation.

Other mountain rescue members arrived along with specialist recovery equipment, including a stretcher, and administered strong pain relief (morphine). He was then taken down the Miners track to a waiting vehicle, and was later airlifted to hospital.

The remaining three hikers had a debrief at Nant Perris Mountain Rescue Centre, and reflected on the day’s events.

2 Suggest a range of pragmatic preventative and remedial measures relevant to the case being studied:

Climbing or hiking up mountains is different to other outdoor sports because it is the natural environment and the elements - altitude, wind, cold/heat, snow etc.- that offer the challenges for those involved, and in the case of helping someone injured while climbing/hiking, the challenges for the rescue services.

Going up high mountains represents the thrill of testing a person's competence, strength, ability, and stamina to the max, often with inherent risks involved.

Therefore, more consideration should have been given to the planning stages, particularly with regard to weather forecasting and local knowledge. This would have led to better planning of alternative routes back down the mountain, and also the choice of more suitable clothing and appropriate equipment to take, and the possible risks and outcomes if something goes wrong. If you're going up a mountain, especially off-track, then you should expect certain things could easily happen – slips, trips and falls.

When they started out on the climb, it was only H1 and H2 together; it was only when they met with two other hikers (H3 & 4) who had already decided to abandon the climb, when they all decided to descend as a four person group, and this was a good decision (safety in numbers) especially as three of the hikers had previously used this unmarked route as a short-cut back to Llanberis, although in much better weather conditions. Collectively they agreed it was the best option under the circumstances, rather than one person dictate to the rest.

Although the “escape route” mentioned by H1 is steep, smooth and with visible rock outcrops, there is an even steeper, more vertical section to the side, and if they had veered onto this it could have led to a far worse outcome.

When H4 initially fell, the others instinctively ran after him, falling themselves, and this hasty decision could also have led to four casualties not one.

I also noticed that they could have chosen better clothing. The casualty had his walking/hiking shoes pulled off during the incident. Also, the casualty was difficult to locate in the mist, as he was wearing dark grey/black clothing, and this is also the same for the three other hikers. Wearing reflective or high visibility clothing, as well as carrying additional layers, is essential in poor conditions.

Regarding first aid, H1 appeared to have some knowledge and did have a small first aid bag, however he did not appear competent to use it especially on the open head wound.

Also, H1 was seen to roll the patient on his side, although this could have complicated the casualties' injuries further. He did this to provide insulation under the patient.

3 Demonstrate the ability to critically assess and respond positively to critical incident scenarios in a range of complex and/or unpredictable contexts

They did not appear to have an Ordnance Survey map with them, as they couldn't tell the emergency services accurately where they were. Being able to read a map to locate your position is an essential hiking skill.

Adventure activities licensing ensures that activity providers (ie: companies, schools, colleges, universities but not private individuals) follow good safety management practices, promote the use of risk assessments - where there are significant risks - and include being able to contact the emergency services.

In fact, there are government agency reports that have found that the "emergency services have difficulty locating the accident scene and consequently taking a long time to attend the scene. It appears that the system that relays the mobile phone signal often only indicates the general location of the caller. Unfortunately, the relay information can be significantly different from the actual location of the caller" (*Health & Safety Executive, 2001*).

If a formal risk assessment been carried out prior to the hike based on the deteriorating weather, the two hikers (H1&2) would have considered what to do if they needed to abandon the hike somewhere along their route – I have produced my own brief example risk assessment for the hike – see Appendix A.

The hikers clearly did not consider the changing weather conditions. It's well documented that that weather on Snowdon at high altitudes can deteriorate rapidly. There is no excuse for this, as there are several readily available sources of information regarding this – Meteorological Office, local retail climbing shops, Llanberis Mountain Rescue Centre and Pen Y Pass visitor centre. Indeed, the forecast for the summit of Snowdon that day stated increasing wind speed, heavy mist and poor visibility!

Something that has been reported in a number of scholarly articles in recent years is the unpredictability of compasses reversing their polarity when kept near mobile phones, as mentioned in the article in "The Professional Mountaineer" (Williams, 2013). Apparently, this can cause the needle to point north, when it clearly should be pointing south, and vice-versa. H1 left the casualty and walked down to the PYG track with only "a compass and whistle" – the area to the east has a vertical drop.

Considering the speed with which the events unfolded, the hikers responded well under the circumstances. They managed to locate the casualty, early intervention of the emergency services, kept him awake and updated and increased the chances of his survival prior to the rescue services arrival.

Conclusion.

As far as hiker H1 was concerned, he adopted an autocratic style of leadership style up to the point where they met the second hiking group (H3 & 4) and this, coupled with some inadequate planning and deteriorating weather conditions made for poor judgement calls. He appeared to use the dynamic risk assessment approach at all stages - thinking of the options only when issues arise. This can be useful tool for less adventurous activities.

It was evident from the video footage, that both H1 and H2 had not carefully thought about what emergencies they could have encountered prior to the climb – H1 jokingly mentioned about the consequences if one of them suffered “a broken leg” and “jacket ripping weather” when they were at the end of Crib Goch !

Had a formal risk assessment been carried out prior to the hike, a better choice of clothing and footwear for the conditions may have been highlighted, and their kit was lacking in some specialist items – for example:

- Footwear – appeared to be trail/hiking shoes, rather than hiking boots which offer better ankle support. Also, they could have considered taking walking poles and snow/ice grips (not crampons) which can be easily added to boots when required – especially on the icy, wet steep path down to the PYG track.
- Jacket, hat and trousers were predominantly dark in colour, which does not allow high visibility in poor light / misty conditions.
- At the Pinnacle, H1 admitted that it was “jacket ripping wind” – this clearly shows that appropriate clothing, and also layers, were required.
- There was no emergency equipment – foil blankets, torches.
- Hiker 1 had a hand-held Go-Pro camera recording throughout. This only left him with one hand free. It would have been better to have a chest-harness for the video camera, leaving both hands available.
- The need for suitable first aid training especially when carrying out adventurous activities, eg: leading someone up Snowdon via Crib Goch.

The *Health & Safety Executive* have issued a recommendation on the reliance of mobile phone GPS location in an emergency, and say that people should “consider giving emergency services a grid reference of the accident site, not just a description” (2001).

When planning the route; be able to use a map & compass; check the weather forecast; carry the right gear; be flexible; plan for the worse - See the Llanberis Mountain Rescue top tips – Appendix C.

In mitigation, the group carried out some positive actions:

- Abandoning the hike, rather than continuing.
- They contacted the emergency services at an early stage.
- Assessed the injuries and attempted first aid provision to the best of their ability
- Kept the casualty conscious and informed throughout
- Identifying insulating the casualty against hypothermia

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Appendix A

My example of a brief risk assessment for a hike up Snowdon in winter:

Example risk assessment for a hike on Snowdon in winter:		Risk Assessment carried out by Jack Laytham	
		10 th December 2021	
Consider:	RISKS:	CONTROLS:	Additional considerations
Weather	Injury due to lightning strike. Injury due to slips/falls occasioned by wet rocks/grass Risk of Hypothermia, particularly if delayed/lost due to poor weather and/or cloud (inc. high winds).	If weather deteriorates, consider retracing your route back to the start – if this is not possible, consider the SAFE alternative routes back to the star (Check maps and speak to Pen Y Pass information Centre / Llanberis Mountain Rescue). All other major injuries, contact emergency services for advice.	Carry foil blankets and bivy-bags. For lightening, avoid any trees, and remove metal items (poles) See below – lack of communication
Steep, broken terrain, slippery rock or grass, muddy or loose paths, Snow/ice patches	Possibility of injury due to slips, trips or falls in ascent/ descent. Risk of injury due to stone fall, either natural or caused by participants or other walkers/cyclists.	Ensure suitable footwear – ankle protection from boots. Consider taking a climbing helmet where there is risk of rock fall - along footpaths below rock outcrops, Crib Goch possibly.	Take walking poles to assist with the ascent / descent. Consider carrying overshoe snow/ice grips – these can be added / removed according to conditions.
Lack of communication in the event of an emergency	Not being able to contact the emergency services and Mountain Rescue. Not knowing where you due to deteriorating weather	Lead person MUST carry a mobile phone & the phone must be registered for the Emergency SMS texting service. Ensure you <u>know (at all times)</u> where you are on Snowdon (Map, GPS) Check locally if mobile phones have a signal on Snowdon. As a back-up, ensure you have torches and whistles.	Could consider purchasing a Personal Locator Beacon / transponder – balance the risk v the cost.

Llanberis Mountain Rescue top 10 tips:

HOW DO I AVOID NEEDING TO BE RESCUED?

1. PLAN YOUR ROUTE

By spending some time researching your chosen route, you'll gain valuable knowledge and an understanding of the terrain. Consider the weather and in particular wind direction and visibility.

2. PLAN THE DAYS LOGISTICS

Work out where the car parks are and also the times for the Sherpa bus service. All the car parks have pay and display machines so make sure you have change.

3. KNOW HOW TO USE A MAP AND COMPASS

While walking keep your map and compass close and monitor features as you pass them. Gain an understanding of basic navigation skill by researching or via a mountain skills course.

4. CHECK THE WEATHER FORECAST

The mountain weather is very hard to forecast. Use the forecast in your planning and check the updated forecast on the day you plan to walk and adjust or change plans to fit in with the weather.

5. CARRY THE RIGHT GEAR

Snowdon is the highest point in England and Wales. The temperature can be 10 degrees colder than in Llanberis, with the wind increases by up to 3 times. See our recommended kit list.

6. ALLOW PLENTY OF TIME

Many avoidable call-outs could be prevented by starting early in the day and allowing plenty of time for the walk. It gets dark every day of the year in Wales, so a head torch for each person is required. The car parks on weekends and holidays will be full by 8am, so consider using the Sherpa bus or starting early.

7. BE FLEXIBLE IN YOUR PLANNING

Once on the mountain, observe the weather and conditions. Make decisions based on how you feel and consider alternate options if difficulties are encountered.

8. HAVE PLENTY OF FOOD AND DRINK

Walking up Snowdon is hard work! High energy snacks along with slow releasing food should be carried and plenty of fluids. See our Kit list for ideas.

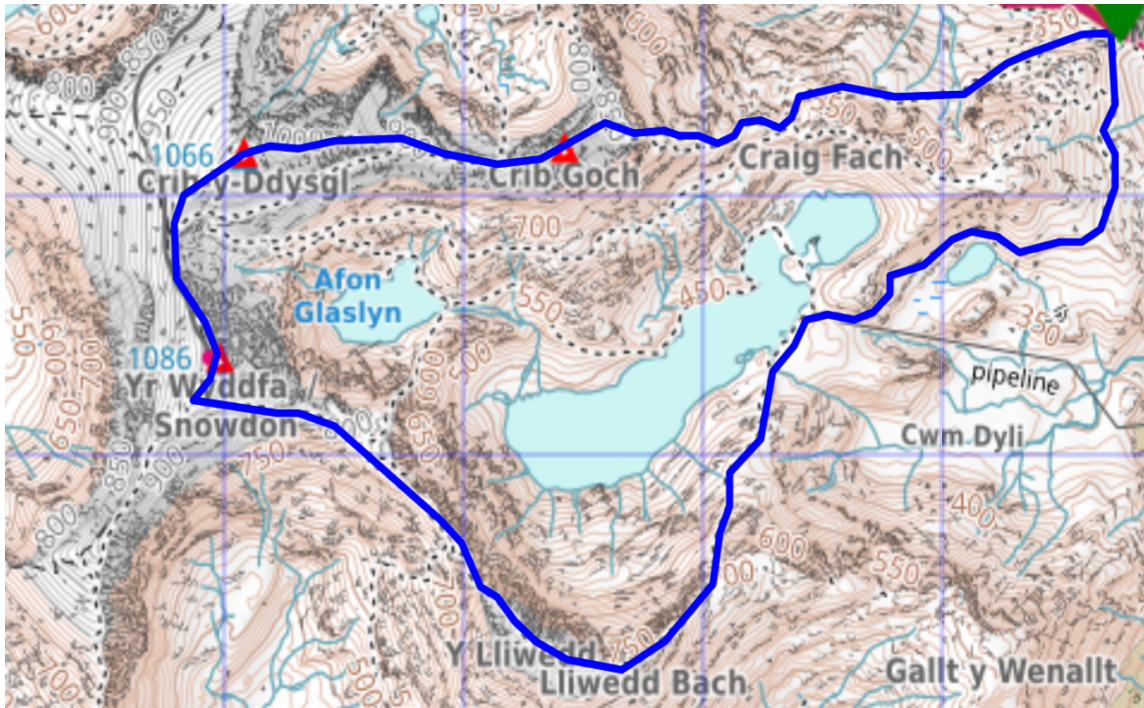
9. DON'T BE AFRAID TO TURN BACK

Don't base your decision to push on if things get bad, based on how far you have travelled to visit Snowdon. Turning back could be the best decision you'll ever make and Snowdon will still be there next time.

10. PLAN FOR THE WORSE – HOPE FOR THE BEST!

Life has its risks and being in the mountains has its fair share too. Despite all precautions, there is still the chance that something can go wrong. Some basic first aid training and carrying additional equipment will help you to deal with these incidents if they occur.

The Horseshoe route:



Route Profile

